February 1938.

INVESTIGATIONS OF SWEET CORN RESISTANCE TO THE EUROPEAN CORN BORER 1935 - 1937

Division of Cereal and Forage Insects
Bureau of Entomology and Plant Quarantine
U. S. Department of Agriculture

European Corn Borer Research

(Not for publication)

INVESTIGATIONS OF SWEET CORN RESISTANCE TO THE EUROPEAN CORN BORER. 1935 - 1937

By Morris Schlosberg, W. A. Baker, and Ralph Mathes, Division of Cereal and Forage Insect Investigations, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture.[1]

Introduction

Investigation of sweet corn resistance to the European corn borer, Pyrausta nubilalis (Hbn.), was begun in 1935 and continued in 1936 and 1937 by the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture in cooperation with the Bureau of Plant Industry of that Department. Materials for the program were furnished by the Federal Bureau of Plant Industry and various State Agricultural Experiment Stations, and consisted of experimental inbred lines and hybrid crosses of Bantam, Country Gentleman, and Evergreen sweet corn. The studies were conducted near Maumee, Ohio, with supervision from the Federal European corn borer laboratory at Toledo, Ohio. To secure adequate infestation among the strains, natural infestation was supplemented by additional infestation with eggs by hand at a uniform rate per plant. The surviving larval progenies, when approximately full-grown, were determined by dissection of the plants. These served as the basis of evaluation of the strains, with due accommodation of bias introduced by variable experimental conditions among the strains. The strains were tested in four-fold replication by the method of Randomized Blocks.

1/ During the progress of the investigations, the writers have received the benefit of advice from P. N. Annand of the Bureau of Entomology and Plant Quarantine and M. T. Jenkins of the Bureau of Plant Industry. Active cooperation throughout the investigation is being maintained with Glenn Smith, Bureau of Plant Industry, Lafayette, Indiana, in all of the essential corn breeding activities. C. A. Crooks, Bureau of Entomology and Plant Quarantine, now associated with the investigations, aided in the assembly and analysis of the data.

Objectives

The general objectives of the investigation embrace the following lines of study: (1) the determination of sweet corn strains possessing resistance to attack by the borer; (2) the intensification and transfer of the trait to agronomically desirable strains adapted to specific localities; and (3) the determination of plant characters associated with inhibition of larval establishment and development as an aid in breeding borer-resistant strains of sweet corn. The studies to date have been concerned principally with the determination of borer-resistant strains, the results being presented herewith.

Three phases of resistance to the borer may be recognized in a strain, namely, (1) repellence to oviposition on the plants, (2) inhibition of larval development on the plants, and (3) tolerance to injury of the plants as reflected in yield. Each affords a separate basis of study. Low populations resulting from repellence to oviposition and inhibition of larval development necessarily do not predicate final evaluation of the resistance of a strain, since lack of tolerance of the plants to injury may more than offset the benefit gained in the production of low yield. Owing to generally prevailing light conditions of natural infestation, it appeared feasible to investigate first the middle phase, inhibition of larval development, by supplementary manual infestation of the strains with eggs, and in later tests confirm the value of the strains with respect to the first and third. The general concept of resistance imposes relative freedom from effect under favorable conditions of attack of a host by an inimical agent. In the present study the effects of what may be termed accidental benefits were eliminated in considering the performance of the strains. Thus, differences in larval populations among a number of strains arising from their variability in seasonal growth and maturity at the time of their infestation with eggs were not considered as evidence of resistance, and were given due account by analytical methods, as clarified later.

Materials

Materials for the tests were provided by the Federal Bureau of Plant Industry, and the following State agricultural experiment stations: Connecticut, Illinois, Indiana (Purdue), Iowa, Maryland, Michigan, Minnesota, and Ohio. The test strains consisted of experimental inbred lines and hybrid crosses of Bantam, Country Gentleman, and Evergreen sweet corn, among which were several released lines. Particular attention was given to the study of the inbred lines as a source of basic characters. In 1935 the strains were selected to represent a wide range of sweet corn types. In 1936 and 1937 the same basis of selection was used, with repetition of the strains showing promise in the previous tests. Owing to the preliminary status of the investigation and the need for general information on the performance of the strains and the technique of discrimination with respect to resistance, a larger number were retained each year for retest than their performance appeared to warrant. Ninety-eight sweet corn strains were planted in 1935, 175 in 1936, and 256 in 1937. Of these 82, 164, and 247 strains, respectively, were successfully tested. Tests of the remainder of the strains were abandoned principally owing to inadequate stands of plants. Three hundred and thirty-seven different strains were represented during the three years of tests. The kinds and numbers of strains furnished by each of the contributors are given in table 1.

Table 1. - Source of strains, sort, and number tested in 1935, 1936, and 1937, near Toledo, Ohio, for resistance to the European corn borer.

Source of strain			Kind and number of strain																				
Sent by:		Agr. Exp. Sta.	Bantam						Country Gentleman						Evergreen						Totals		
			Inbred			Hybrid			Inbred			Hybrid			Inbred			Hybrid					
Year			'35	'36	'37	'35	'36	'37	'35	'36	'37	'35	'36	'37	'35	'36	'37	'35	'36	'37	'35	'36	'37
1	W.R.Singleton	Conn.	4	4	3	2	0	3	0	0	0	0	0	0	3	5	3	0	0	2	9	9	11
2	W.H.Huelsen	Ill.	0	0	0	0	0	0	3	14	11	18	13	28	1	3	3	0	3	14	27	33	56
3	E.S.Haber	Iowa	3	6	9	0	5	7	3	4	5	6	3	14	6	7	7	9	8	10	27	33	52
4	R.G.Rothgeb	Md.	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	4	4	0	7	7
5	C.H.Mahoney	Mich.	3	16	8	0	6	20	0	0	0	0	0	0	2	5	2	0	0	0	5	27	30
6	I.J.Johnson	Minn.	1	10	8	0	10	13	0	0	0	0	0	0	0	0	0	0	0	0	1	20	21
7	J.B.Park	Ohio	0	5	1	0	0	0	0	0	0	0	0	0	0	14	4	0	0	3	0	19	8
8	G.M.Smith*	Purdue	6	6	3	5	0	2	1	10	56	0	0	0	1	10	9	0	0	0	13	26	70
9	Commercial	Purchs'd	0	0	0	13	1	0	0	0	0	1	0	0	0	0	0	2	0	0	16	1	0
Totals			17	47	32	20	22	45	12	28	72	25	16	42	13	47	31	11	15	33	98	175	255**

* U. S. Bureau of Plant Industry.

** An additional strain of flint corn (Maize Amargo inbred) was received in 1937 from A. R. Marston, Michigan Agr. Exp. Sta. (used in crosses with sweet corn) bringing the total in that year to 256.

Experimental Procedure

Experimental layout. The experimental design in each year followed the method of Randomized Blocks[1]. Quadriplicate tests were provided in each year with exception of part of the strains in 1935, which were tested in triplicate. In 1935 the strains were randomized in the experiment regardless of sort. In 1936 and 1937 the strains were segregated in sections according to sort to reduce competitive effects. In 1936 each block comprised 7 sections of 25 strains each, and in 1937 eight sections of 32 strains each. The strains were randomized in the sections and the sections in the blocks. In 1935 the plots consisted of 3 rows each 45 feet long, in the case of the strains that were tested in quadriplicate. The middle row was used for data, the outer rows serving as buffers. The plants were spaced at approximately 15 inches. Each test row was divided into three sections, one receiving only natural infestation, the second additional infestation with one egg mass, and the third additional infestation with two egg masses. In the case of the strains tested in triplicate in that year, a single row, fifteen feet long, was provided for each rate of infestation, with no buffer rows between them, as basis for a trial test. A borer migration effect was noted, and the method subsequently discarded. The data obtained from the first and third sections were considered in the present problem. Single row plots were used in 1936 and 1937. Each plot was 30 feet long, with plants spaced at approximately from 9 to 12 inches. In each plot half of the plants were naturally infested, and 12 plants (if available) in the remaining half infested by hand with 2 egg masses. The two sections were separated by 3 feet of space in 1935 and 1936, and by buffer plants in 1937. In 1936 each test plot alternated with a buffer-row plot of a commercial variety of the same sort as the test strain. In 1937 the same method was provided but undue rainfall prevented planting of the buffer plots. The wide space (eighty inches) between the test plots, however, appeared to serve the same purpose, namely, avoidance of the effects of borer migration, since no leaf contact was possible.

Size of samples for insect and plant measurements. A uniform sample of ten plants in each test plot was used to obtain the various measurements required, providing forty plants for each measurement in the case of each strain (four replications of ten plants each). In some instances fewer than ten plants were present when the available number were used. The mean results for the numbers of plants available were used in the analysis of the data. With the exception of natural infestation, all other data were taken on the same samples of plants. Other exceptions are noted in the discussion of the specific measurement concerned.

1/ Fisher, R. A.
1932. Statistical Methods for Research Workers. Ed.4, 307 pp. illus. Edinburgh and London.

Methods and dates of planting. In 1935 the strains that were tested in quadriplicate were planted on May 21, and those tested in triplicate on May 22. In 1936 the test strains were planted on May 21. The buffer varieties were planted at a later date (June 1 and 2) to avoid their undue competition with the test strains for eggs during moth flight, and to reduce their general vigor until the time of dissection of the test strains to determine borer populations. In 1937 the test strains were planted on May 25. Undue rainfall prevented the planting of the buffer varieties. A modified hand-planter was used to drop the kernels at approximately the required spacing of the plants. In 1937, owing to inclement conditions, a top-dressing of nitrate of soda (16 percent nitrogen) was applied at the row on July 12 at a rate of 100 pounds per acre.

Method and dates of infestation. The egg masses for the manual infestation of the plants were obtained from moths confined in screened cages. Oviposition occurred on sheets of waxed paper inserted in the cages. To provide for attachment on the plants the individual egg masses were cut from the sheets and transfixed with common pins. Before transfer to the plants they were then incubated in the laboratory at a mean temperature of 80 degrees Fahrenheit and a relative humidity of not less than 90 percent until ready to hatch, generally within the fourth day of being laid. Generally, the egg masses were attached on the mid-rib on the upper surface of a leaf well protected from direct sunlight. Hatching on the plants occurred within 6 hours to 1 day of application. Eggs laid in the field had a mean hatching time of 5 days. Hand infestations were made at a rate of 2 egg masses per plant, each containing an average of 30 eggs. In 1935 the strains tested in quadriplicate were infested with both egg masses on the same date, July 21. Infestation of the strains tested in triplicate began on July 23 and ended on July 25. In 1935 the period of natural oviposition extended from approximately July 1 to the first week in August, with heaviest egg laying about July 12. In 1936 a single egg mass was attached to each plant of each strain on each of two dates, July 7 and July 12. Natural oviposition extended from June 14 to August 23, including the eggs laid by a partial second generation of moths. Second-generation oviposition, however, mainly was confined to late-planted corn nearby which was the preferred host owing to suitable development. First-generation oviposition extended approximately from June 14 to July 23, with heaviest laying about July 9. In 1937, although all test strains were planted on the same date, it appeared desirable to infest the Bantam strains at an earlier date than the generally later maturing Country Gentleman and Evergreen strains. The Bantam strains were infested with both egg masses on July 13. The Country Gentleman and Evergreen strains were infested with a single egg mass on each of two dates, July 22 and July 26, as the eggs became available. An exception was made in block 1 which, owing to the near hatching of available egg masses, was infested with the second egg mass on July 25. Natural oviposition occurred approximately between June 19 and July 22, with the peak about July 10. Oviposition by a partial second generation of moths occurred during August, but infestation from this source, while fairly heavy, was of no consequence in the experiment as the resultant larvae were readily distinguished by size from first-generation larvae at the time of dissection of the plants. Generally lower survival rates prevailed among the strains in 1937 than occurred in 1935 and 1936, possibly as a reflection of the frequent rainfall during infestation and the generally poorer condition of the plants.

Methods and dates of larval population determinations. The larval populations contained in the natural and hand-infested sections of the plots were determined by dissection of the plants approximately 30 days after the date of hand infestation, when the borers were approximately full-grown. A ten-plant sample was dissected in each section, totalling 40 plants per strain for each level of infestation (four replicates). Where stands were inadequate to provide ten plants the available number were dissected. The mean number of borers per plant per replicate was used in the analysis of the data. In 1935 dissection of the plants was begun on August 12 and completed August 29. With exception of a number of the earliest maturing strains each replicate block was completed before another was begun. In 1936 dissection of the plants was begun August 7 and completed August 26. Owing to the presence of a large number of early maturing strains, the dissection proceeded from these to the later maturing strains in succession to avoid the effect of borer migration associated with the drying of the strains. The natural and hand-infested sections were dissected at the same time. In 1937 dissections of the hand-infested sections of the Bantam strains was begun August 12 and completed August 17. The naturally-infested sections were dissected between August 17 and August 19. The hand-infested sections of the Country Gentleman and Evergreen strains were dissected during the period of August 19 to August 28, and the naturally-infested sections during the period August 28 to September 1. In each group of strains the hand-infested sections were dissected first to avoid the effect of borer migration associated with concentration of larval population. Dissection of a group of strains in any one block was completed before dissection of the same group in a second replicate block was begun.

Plant development records. The need for certain measures of plant development, concomitant with borer development phenomena, and the methods applied to obtain them are discussed in the topic following for greater clarity.

Experimental Discrepancies and Data for Correction

Owing to the large number of strains included in the tests, it was impractical to attempt an adjustment of planting date to accommodate their differences in seasonal growth and maturity, nor was it possible to control their rates of natural infestation. The resultant experimental discrepancies among the strains were reflected in the larval populations obtained. To evaluate the strain results on the basis of uniform experimentation it was essential to give due account to the varying experimental conditions among them. Data were obtained on the following variables for this purpose: (1) The rates of natural infestation of the strains, as represented by the larval progenies surviving from naturally-deposited eggs on the plants; (2) the dates of appearance on the plants of the tassels, pollen, and silks; (3) the height of the plants in inches at various stages of insect phenomena, such as peak of natural oviposition, the dates of hand-infestation of the plants, and the dates of larval population determinations; and (4) the numbers of tillers on the plants. The variates and the methods applied to their measurement are given below, with a brief discussion of the relation of each to the problem. The results of previous experiments afforded the basis of selection of the variates measured.

Recording of natural infestation. Similar samples of plants, contiguous in the test rows, were used to record the number of larvae that had survived from eggs naturally oviposited on the plants than those which were used in the determination of survival in the hand-infested sections. Although, in general, natural infestation of the plants occurred at an earlier date than the hand infestations, the larval determinations were made in both samples of plants at about the same time. The larval populations were determined by dissection of the plants at the approximate time of the full growth of the borers.

The rates of natural infestation among strains of corn are known to vary mainly as a result of variations in seasonal growth and maturity which affect both natural oviposition and the survival of larval progeny. Since, in the present study, the experiments were controlled with respect to hand-infestation but varied with respect to seasonal growth and maturity of the strains, the variability in larval populations arising from a differential of natural infestation required compensation. Accounting of natural egg deposition proved a prohibitive measure owing to the labor entailed. It appeared feasible, however, to determine the larval populations resulting from natural oviposition in an adjacent sample of plants in the case of each strain, and to apply this data to explain the variability arising therefrom. The variability in larval populations among the strains in the hand-infested sections was found highly associated with the variability in the rates of natural infestation among the strains.

Recording of tassel, pollen and silk data. The tassels, pollen, and silks were recorded on the dates of first appearance, ten successive plants, tagged and numbered at the beginning of the season, being examined daily in each plot. In 1935 and 1936 the data were taken on the plants in the naturally-infested sections of the plots to avoid undue handling of the more heavily infested plants, but some difference in height was noted in the hand-infested sections owing to larval activity and in 1937 the data were recorded from these sections.

The mean tasseling dates of the strains when expressed as the number of days from a base date common to all (June 30) afforded a measure of their relative developmental condition at the time of hand-infestation of the plants with eggs. The pollen-shedding and silking dates, respectively, similarly furnished this information. Any one of the three phenomena of development which gave the better result was used in the case of each category of strains considered as a group for analysis. The selection of June 30 as the base date bears no significance to the problem other than that of convenience. The actual dates of tasseling, pollen-shedding, or silking readily may be calculated from the figures given. The number of days from planting to any one of the three stages of development may be obtained by addition of the number of days elapsed from the planting date (May 21 in 1935 and 1936, and May 25 in 1937) to June 30. Consideration of the relative developmental condition of the strains when infested by hand with eggs was prompted by previous studies which had disclosed an association of the survival of larval progeny with the stage of development of the plants when infested. The rates of survival increased as the plants were older when infested with eggs. In the present study the variability in larval populations among the strains arising from developmental variant could not be considered as a reflection of resistance to borer development, necessitating accommodation of the influence of this variant through statistical analyses. A large part of the variability in larval populations among the strains was found associated with the developmental variant.

The presence of the tassel (in early stage of development) at the time of infestation had been found to contribute to the survival of larval progeny. The actual numbers of tassels present at the time of infestation therefore were determined and expressed as percents of the totals. The resultant variant was used to explain, in part, the variability in larval populations among the strains. A high correlation existed between this variant and the variants respectively expressed by the tassel, pollen-shedding, and silk dates.

Recording of plant height. All plants on which tassel, pollen, and silk data were taken were measured for height at various stages of insect development during the season. The measurement on any given date consisted of the distance from the ground level at the base of the stalk to the tip of the leaf remaining when the plant was lightly brushed through the hand. In 1935 the height of the strains was measured on July 18, July 27 (average), and September 3, the latter measurement being taken on a different sample of plants following dissection of the former. In 1936 the strains were measured on June 23, July 3, July 10, July 17, and August 12. In 1937 all the strains were measured on July 7, at approximately the peak of natural oviposition. Weekly measurements were impossible. Therefore the Bantam strains were restricted to measurements on July 14, at the approximate time of hand-infestation of the plants, and August 11 at the approximate time of the larval determinations. The Country Gentleman and Evergreen strains similarly were restricted to measurements of the plants on July 24 and August 19. The height measurements associated with natural oviposition were used in the analyses of the data; that of July 18 in 1935, July 10 in 1936, and July 7 in 1937.

In previous studies, where simple relationships existed between the seasonal growth of the strains and their relative stage of maturity, the height variant was found highly associated with both the number of eggs oviposited on the strains and the survival of larval progeny. The taller strains at moth flight, in general, were found more attractive for oviposition. The association of plant height with the survival of larval progeny probably was a reflection of significant relation between the height of the plants and their relative stage of maturity at the time of infestation, and therefore indicative of the latter influence. In the present study, however, the seasonal growth of the strains presented a complex situation in the fact that early and later stages of development were represented by both short and taller strains at any time of measurement associated with borer development. Nevertheless, the height variant was included in the estimate of explainable variability in larval populations among the strains, as mainly associated with differences in natural infestation among the strains. While generally of nonsignificant influence in the regression, improvement by its use was noted.

Recording of tillers on the plants. The numbers of tillers present on the plants that were dissected for the larval determinations were counted at the time of their dissection. In 1935 and 1936 tiller development was vigorous and significant differences in numbers occurred among the strains. Owing to seasonal influences the numbers of tillers produced on the plants in 1937 were insufficient to warrant consideration.

Little information was found available on the relation of the tillers to the survival of larval progeny, but as their numbers differed among the strains their relative influence was considered worthy of attention. In a previous experiment, in which the numbers of tillers comprised the variant, little influence had been noted on the survival of the larval progeny from uniform infestation with eggs. In the present instance, the use of the tiller variate was accompanied by an improvement of the estimate of explained variability in larval populations among the strains, but the regression was found of nonsignificant character. However, the improved estimate appeared to warrant its use.

Method of Adjustment and Evaluation of the Strain Results for their Varying Experimental Conditions.

Measurements were made of the varying experimental conditions among the strains, as described above. Prescribed analytical methods [1] were applied to these data in the establishment of larval expectancies for the varying experimental conditions encountered among the strains. Multiple regression equations were derived from the data which accommodated the relative changes in larval population (dependent variate) associated with the relative changes in the respective independent variates used. The equations were used to estimate the expected larval populations. The expected larval populations thus obtained constituted the average performance of the strains adjusted in the case of each strain to its varying conditions of test. Thus a standard of performance was provided in the case of each strain comparable to the average performance of the strains. The deviations of the observed from the expected larval populations, therefore, constituted the relative performance of the strains under identical conditions of test, and reflected the differences in performance among them. However, the objective of the tests centered interest on the extent of the deviation.

Since the deviations of the observed from the expected larval populations reflected, in addition to the experimental error, the influence of factors not considered in the multiple regression, they afforded a clue to discrimination among the strains in the selection for possible resistance to the borer. It appeared feasible to conclude that (1) small deviations, whether positive or negative, indicated average performance of the strains, (2) large positive deviations possible susceptibility, and (3) large negative deviations possible resistance to borer establishment and development. To provide a standard basis of selection at least once the standard error of estimate arbitrarily was chosen as the maximum of deviation ascribable to average performance.

The Experimental Results

The experimental strain results for the specific years are presented in tables 2 to 7. The strain pedigrees, their test numbers in the respective year of test, and their test numbers in other seasons are given in columns 1, 2, and 3, respectively. The data relating to variability in the experimental conditions among the strains are given in columns 4 to 9, and the independent variable represented by each column identified by the letter symbols A to F,

---

1 Wallace, H. A. and Snedecor, G. W.
1931. Correlation and Machine Calculation. Iowa State College of Agriculture and Mechanic Arts Bulletin, Vol. XXX, No. 4.

Table 2. - Data relating to sweet corn strains tested in 1935, near Toledo, Ohio, for resistance to the European corn borer. Mean results based on quadruplicate tests for strains 1 to 32 and triplicate tests for strains above 32. *

	Strain pedigree and source	Strain number 1935	Strain number 1936	Mean percent of plants tasseled on July 22	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 18 (inches)	Mean number of tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
	1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
A.	INBRED STRAINS											
	Group 1. Bantam Inbred Lines (Seventeen strains)											
1	P39 (Purdue)	1	145	100	15	29	38	.9	1.0	7.0	9.2	- 2.2
2	P51 (Purdue)	6	147	100	16	28	44	3.2	1.3	10.9	10.3	+ .6
3	47 (Iowa)	8	106	100	16	26	47	.5	.4	6.4	7.0	- .6
4	1313-1-1-1(Purdue)	14	142	100	14	28	45	1.1	.4	6.8	7.6	- .8
5	45 (Iowa)	15	101	85	20	31	46	.1	.8	6.0	7.5	- 1.5
6	38-28 (Minn.)	18	132	100	9	22	46	1.1	2.8	11.1	11.9	- .8
7	13 (Iowa)	25	102	100	20	31	40	.7	.5	8.0	7.9	+ .1
8	14-1-2-6 (Purdue).....	28	146	100	17	30	44	1.0	.8	7.6	8.3	- .7
9	8482-3-1 (Purdue).....	30	144	100	16	27	49	1.1	.7	6.6	7.6	- 1.0
10	C 7 (COnn.)	38	135	100	12	29	44	1.5	2.3	10.5	11.3	- .8
11	331098 (Mich.).....	40	-	100	18	30	42	.3	1.7	7.2	9.7	- 2.5
12	P39 Commercial (Purdue).	50	-	100	18	27	51	1.1	3.0	12.1	11.5	+ .6
13	C 2 (Conn.).....	67	133	70	12	31	39	.8	1.3	13.9	9.7	+ 4.2
14	32512 (Mich.)	68	-	100	19	32	34	1.1	1.3	9.6	10.2	- .6
15	C 13 (Conn.)	73	136	100	4	16	37	.3	3.2	13.5	13.3	+ .2
16	C 6 (Conn.)	82	134	100	8	24	40	.5	2.9	9.5	12.5	- 3.0
17	331073 (Mich.).....	90	-	87	21	32	37	.3	1.1	8.1	9.1	- 1.0
	Group 2. Country Gentleman Inbred Lines (Twelve strains)											
1	R10 (Illinois)	3	164	75	21	33	47	.2	.6	6.6	7.0	- .4
2	R9 (Illinois)	7	163	5	25	40	43	.4	.4	6.2	7.0	- .8
3	900 (Iowa)	9	149	58	22	36	43	.1	1.2	6.6	8.4	- 1.8
4	1620(Iowa)	10	148	20	24	37	46	.1	.6	7.6	6.9	+ .7
5	R 15(Illinois)	11	165	100	19	36	44	1.0	.5	8.0	7.6	+ .4
6	R 4 (Illinois)	12	159	85	18	32	41	.4	.5	9.1	7.7	+ 1.4

Table 2. - (Continued)

Strain pedigree and source	Strain number 1935	Strain number 1936	Mean percent of plants tasseled on July 22	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 18 (inches)	Mean number tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9 (F)	10 (X)	11**	12***
Country Gentleman Inbred Lines (Continued)											
7 R1 (Illinois).....	16	157	70	22	36	45	.3	.8	6.0	7.6	- 1.6
8 R3 (Illinois).....	19	158	58	22	33	48	.7	.4	7.4	6.8	+ .6
9 1445 (Iowa)	23	151	3	28	38	43	.2	.4	4.4	6.8	- 2.4
10 R8 (Illinois)	24	162	38	23	39	44	.3	.4	4.4	6.9	- 2.5
11 22-2-2 (Purdue)	26	168	98	18	32	47	.2	.7	10.0	7.3	+ 2.7
12 R 6 (Illinois)	29	161	55	22	34	47	.1	.7	6.0	7.1	- 1.1
Group 3. Evergreen Inbred Lines (Thirteen strains)											
1 1071 (Iowa)	2	216	0	30	42	44	.3	.3	5.9	6.5	- .6
2 1009-2 (Purdue)	4	185	58	22	36	42	1.7	.2	7.0	7.5	- .5
3 1363 (Iowa)	5	211	12	25	40	43	0	.5	7.8	7.0	+ .8
4 377 (Iowa)	13	-	80	22	32	41	.4	.6	5.6	7.7	- 2.1
5 777 (Iowa)	20	212	12	28	36	47	.2	.6	7.3	6.8	+ .5
6 14 (Illinois)	22	188	5	24	33	51	.2	.8	8.2	6.8	+ 1.4
7 261 (Iowa)	31	215	18	25	39	39	0	.3	7.7	7.0	+ .7
8 191 (Iowa)	32	217	62	22	31	48	0	.9	6.5	7.3	- .8
9 331212 (Mich.)	37	-	77	23	35	47	1.1	1.9	13.2	9.8	+ 3.4
10 C 77 (Conn.)	46	219	100	14	29	38	.1	1.6	14.1	9.9	+ 4.2
11 C 85 (Conn.)	54	221	90	21	35	38	.3	2.5	15.3	11.5	+ 3.8
12 331220 (Mich.)	83	-	90	20	30	42	.5	1.7	7.5	9.7	- 2.2
13 C 78 (Conn.)	88	220	100	20	32	40	.1	1.6	11.7	9.6	+ 2.1
B. HYBRID STRAINS											
Group 4. Bantam Hybrid Strains (Seven strains)											
1 (P51 x P39) X 14 (Purdue).	17	-	100	14	27	50	1.1	.9	7.2	7.9	- .7
2 P 39 X 14 (Purdue).....	21	-	100	14	27	51	.8	1.2	6.9	8.2	- 1.3
3 (P51 X P39) X 1313 (Purdue)	27	-	100	14	27	49	1.6	1.7	8.1	9.7	- 1.6

Table 2. - (Continued)

Strain pedigree and source	Strain number 1935	Strain number 1936	Mean percent of plants tasseled on July 22	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 18 (inches)	Mean number tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11 **	12***
Bantam Hybrid Strains (Continued)											
4 Whipcross C2 P39 (Conn.)..	51	-	100	12	27	47	.8	1.8	13.3	9.8	+ 3.5
5 (1313 x P51) X P39 (Purdue)	53	-	100	14	27	50	1.4	3.2	12.1	12.2	- .1
6 Whipcross P39 (Conn.)	62	-	100	14	28	52	1.6	2.4	11.1	10.7	+ .4
7 P39 X P51 (Purdue)	69	-	100	14	28	48	1.7	1.4	10.7	9.3	+ 1.4
Group 3. Country Gentleman Hybrid Strains (Twenty-four strains)											
1 9 X 1 (Illinois)	36	255	97	22	38	53	.1	2.1	7.0	9.0	- 2.0
2 (1612x908)X 1445 (Iowa) ...	39	-	83	28	38	49	.3	1.1	9.5	7.6	+ 1.9
3 888 X 1610 (Iowa)	41	-	23	28	37	52	.3	1.6	7.1	8.1	- 1.0
4 6 X 4 (Illinois)	42	-	100	20	33	50	.5	1.6	10.2	8.7	+ 1.5
5 8 X 3 (Illinois)	44	253	70	25	37	47	.4	1.3	7.4	8.3	- .9
6 9 X 4 (Illinois)	47	258	97	22	36	50	.4	1.6	7.5	8.6	- 1.1
7 4 X 3 (Illinois)	48	-	100	20	32	51	.6	.9	7.9	7.4	+ .5
8 1 X 10 (Illinois)	52	-	93	22	37	46	.1	1.6	9.1	8.9	+ .2
9 10 X 4 (Illinois)	55	-	97	20	33	51	.4	1.7	8.8	8.7	+ .1
10 9 X 6 (Illinois)	58	257	100	22	35	52	.1	1.5	7.3	8.1	- .8
11 9 X 3 (Illinois)	61	256	97	22	36	52	.6	1.4	8.6	8.1	+ .5
12 1 X 3 (Illinois)	63	-	97	21	35	56	.4	2.5	8.0	9.6	- 1.6
13 1464 X 1610 (Iowa)	65	-	97	22	38	53	.3	2.3	8.9	9.5	- .6
14 6 X 15 (Illinois)	75	-	100	20	35	54	.7	3.5	10.7	11.8	- 1.1
15 1919 X 1445 (Iowa)	76	-	40	26	37	50	.5	1.2	12.0	7.8	+ 4.2
16 9 X 10 (Illinois)	77	259	100	22	33	54	.3	1.9	9.9	8.7	+ 1.2
17 1389 X 908 (Iowa)	80	-	33	27	39	54	.5	1.1	7.3	7.1	+ .2
18 8 X 15 (Illinois)	85	254	100	21	36	54	.9	2.0	6.3	9.2	- 2.9
19 10 X 15 (Illinois)	87	260	93	21	37	46	.3	2.1	8.0	9.9	- 1.9
20 3 X 10 (Illinois)	89	-	100	21	32	52	.3	2.5	10.3	10.0	+ .3
21 3 X 6 (Illinois)	92	251	100	21	33	54	.4	2.3	11.9	9.5	+ 2.4
22 1607 X 1445 (Iowa)	93	-	93	24	36	56	.4	2.1	10.0	8.8	+ 1.2
23 1 X 6 (Illinois)	95	248	100	[illegible]	35	55	.1	1.8	11.4	8.3	+ 3.1

Table 2. (Continued)

Strain pedigree and source	Strain number 1935	Strain number 1936	Mean percent of plants tasseled on July 22	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 18 (inches)	Mean number tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9 (F)	10 (X)	11 **	12***
Country Gentleman Hybrid Strains (Continued)											
24 4 X 1 (Illinois).....	93	-	97	20	33	49	.2	2.2	9.9	9.8	+ .1
Group 6. Evergreen Hybrid Strains (Nine strains)											
1 (1313 X 486) X 191 (Iowa)	59	-	100	19	30	56	.5	2.1	9.7	9.0	+ .7
2 777 X 191 (Iowa).....	64	267	63	24	33	56	.3	1.9	8.4	8.4	0
3 191 X 377 (Iowa).....	71	-	100	22	29	54	.1	1.9	9.9	8.6	+ 1.3
4 1120 X 777 (Iowa)	72	-	0	31	38	57	.7	1.3	8.5	7.1	+ 1.4
5 1363 X 191 (Iowa)	74	266	97	22	33	59	.0	1.4	5.7	7.1	- 1.4
6 1120 X 261 (Iowa)	79	-	23	28	37	53	.4	2.2	7.6	9.1	- 1.5
7 12 E X 191 (Iowa)	91	265	100	22	31	60	.1	2.9	8.5	9.8	- 1.3
8 1071 X 191 (Iowa)	94	268	23	28	36	56	.1	2.0	9.4	8.3	+ 1.1
9 1077 X 261 (Iowa)	97	-	50	26	38	54	.3	3.8	10.5	12.0	- 1.5
General average (all strains)			77.7	20.4	32.9	47.7	.3	1.5	8.8		
Standard deviation from mean			32.077	5.062	4.558	5.800	0.525	0.845	2.321		

* Measurements in each replicate based on ten plants, totalling forty plants per strain for strains 1 to 32 and thirty plants per strain for strains above 32, with some exceptions.

** Calculated by the following equation based on the data in columns 4 to 10: Expected population = 11.34828 + (+.00114)A +(-.02505)B +(-.00272)C +(-.10604)D + (+.50731)E +(+1.80787)F. The mean results for each strain, in the columns corresponding to the respective letters in the equation, are substituted for the letters.

*** Error of estimate of individual strain results. Standard error of estimate is 1.781.

Table 3.- Data relating to sweet corn strains tested in 1936, near Toledo, Ohio, for resistance to the European corn borer. Mean results based on four replicated tests in random blocks. *

Strain pedigree	Strain number 1936	Strain number 1937	Mean percent of plants tasseled on July 12	Mean number of days after June 30 to appearance on 50 percent of plants of: Tassels	Silks	Mean plant height on July 10 (inches)	Mean number tillers per plant	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
A. INBRED STRAINS											
Group 1. Bantam Inbred Lines (Forty-seven strains - 39 tested)											
Seed obtained from Iowa State Agr. Exp. Sta. (Dr. E. S. Haber) Six strains											
1 45	101	284	85	10	24	41	2.2	1.4	5.8	8.6	- 2.8
2 13	102	280	10	16	32	35	1.9	1.2	5.8	5.9	- .1
3 1804	103	287	90	8	22	34	2.2	.9	10.4	8.2	+ 2.2
4 9	104	279	20	15	29	36	.8	1.2	2.9	6.4	- 3.5
5 51	105	286	2	18	32	40	2.6	1.5	6.1	5.6	+ .5
6 47	106	285	2	17	30	39	.3	.9	5.1	5.4	- .3
Seed obtained from Michigan State Agr. Exp. Sta. (Dr. C. H. Mahoney) Sixteen strains											
1 351525	107	-	Insufficient stand for testing				-	-	-	-	
2 351540	108	-	"	"	"	"	-	-	-	-	
3 351542	109	-	"	"	"	"	-	-	-	-	
4 351544	110	-	"	"	"	"	-	-	-	-	
5 351085	111	-	"	"	"	"	-	-	-	-	
6 351776	112	-	"	"	"	"	-	-	-	-	
7 351781	113	-	"	"	"	"	-	-	-	-	
8 351233	114	-	"	"	"	"	-	-	-	-	
9 351819	115	-	90	9	25	38	1.6	2.5	9.4	10.6	- 1.2
10 351820	116	291	98	9	27	44	2.2	1.1	9.9	8.7	+ 1.2
11 351826	117	293	100	4	22	35	3.2	1.1	8.1	8.9	- .8
12 351818	118	290	45	14	30	25	3.1	1.2	6.4	6.9	- .5
13 351828	119	288	88	9	25	41	.7	.6	5.0	8.0	- 3.0
14 351824	120	-	100	4	21	42	3.2	.7	10.0	8.2	+ 1.8
15 351249	121	289	75	10	26	31	3.5	1.4	6.6	8.2	- 1.6
16 351825	122	295	100	1	14	37	1.7	2.0	12.4	10.5	+ 1.9

Table 2. (Continued)

Strain pedigree	Strain number 1936	Strain number 1937	Mean percent of plants tasseled on July 12	Mean number of days after June 30 to appearance on 50 percent of plants of: Tassels	Silks	Mean plant height on July 10 (inches)	Mean number of tillers per plant	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
BANTAM INBRED STRAINS (Continued)											
Seed obtained from Minn. State Agr. Exp. Sta. (Dr. I. J. Johnson) Ten strains											
1 1-34	123	296	88	10	23	35	1.6	.8	9.5	8.0	+ 1.5
2 6-34	124	297	98	6	23	40	3.0	1.4	9.2	9.1	+ .1
3 13-34	125	298	98	6	23	37	2.4	2.0	8.2	10.2	- 2.0
4 14-34	126	299	100	7	23	35	2.8	2.6	11.8	11.0	+ .8
5 23-34	127	300	100	7	25	40	3.0	1.5	14.2	9.3	+ 4.9
6 26-34	128	301	100	1	20	37	.9	1.9	6.3	10.9	- 4.6
7 27-34	129	-	100	3	20	39	2.3	1.2	10.0	9.3	+ .7
8 34-34	130	-	80	11	25	32	1.6	1.6	8.8	9.0	- .2
9 42-28	131	303	100	5	20	44	2.8	1.6	13.9	9.4	+ 4.5
10 38-28	132	302	98	5	19	39	2.4	2.2	11.2	10.4	+ .8
Seed obtained from Conn. State Agr. Exp. Sta. (Dr. W. R. Singleton) Four strains											
1 C-2	133	276	78	10	29	37	1.8	1.0	10.9	8.2	+ 2.7
2 C-6	134	277	100	3	24	37	2.0	1.2	10.8	9.6	+ 1.2
3 C-7	135	278	85	10	25	39	2.0	1.4	6.4	8.7	- 2.3
4 C-13	136	-	100	0	12	38	1.3	2.0	11.6	10.6	+ 1.0
Seed obtained from Ohio State Agr. Exp. Sta. (Dr. J. B. Park) Five strains											
1 sG 202-1-1-6	137	-	89	10	28	37	3.6	2.8	11.8	10.6	+ 1.2
2 sG 206-2-1-5	138	-	79	11	26	36	5.2	1.4	4.9	7.6	- 2.7
3 sG 200-1-1-5	139	-	53	12	27	35	1.5	1.3	5.3	7.6	- 2.3
4 sG 204-1-1-6	140	-	18	16	32	40	2.6	.4	4.8	4.4	+ .4
5 sG 192 -2-1-4	141	-	0	20	33	37	2.1	.9	4.7	4.7	.0

Table 3. - (Continued)

Strain pedigree	Strain number 1936	Strain number 1937	Mean percent of plants tasseled on July 12	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 10 (inches)	Mean number of tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
BANTAM INBRED STRAINS (Continued)											
Seed obtained from Purdue Agr. Exp. Sta. (G. M. Smith, U.S.Bureau Plant Industry) Six strains											
1 1313-1-1-1	142	305	88	10	30	41	3.8	.7	8.6	7.5	+ 1.1
2 1351 B	143	-	22	14	29	40	3.0	.7	5.7	5.2	+ .5
3 8482-3-1	144	-	45	14	29	37	3.1	2.1	8.5	8.0	+ .5
4 P 39	145	-	70	11	28	38	2.5	.8	7.2	7.3	- .1
5 14-1-2-6	146	307	52	13	29	39	1.6	1.6	7.2	7.9	- .7
6 P 51	147	306	15	15	31	41	3.6	.8	5.8	4.9	+ .9
Group 2. COUNTRY GENTLEMAN INBRED LINES (Twenty-eight strains											
Seed obtained from Iowa State Agr. Exp. Sta. (Dr. E. S. Haber) Four strains											
1 1620	148	323	0	22	40	40	1.6	.6	4.1	4.4	- .3
2 900	149	319	0	18	37	42	.2.	1.6	8.7	6.5	+ 2.2
3 1434	150	320	0	30	44	42	1.0	.8	1.6	4.2	- 2.6
4 1445	151	321	0	25	41	36	1.6	.4	2.2	4.0	- 1.8
Seed obtained from Illinois State Agr. Exp. Sta. (Dr. W. A. Huelsen) Fourteen strains											
1 124-318	152	317	0	16	32	40	.8	.6	7.1	4.9	+ 2.2
2 123-317	153	-	0	20	36	36	.8	1.3	4.5	5.8	- 1.3
3 359-121	154	-	2	18	34	36	2.0	.8	5.1	4.9	+ .2
4 573-354	155	-	0	22	38	35	1.6	.2	3.5	3.9	- .4
5 318-261	156	-	0	20	37	37	.7	1.0	4.6	5.4	- .8
6 R1	157	308	0	19	34	40	.8	.8	6.3	5.0	+ 1.3
7 R3	158	309	2	20	34	43	2.2	2.1	6.7	6.4	+ .3
8 R4	159	310	0	16	33	34	1.5	.7	5.7	5.0	+ .7
9 R5	160	311	0	17	34	43	.7	.8	6.2	5.1	+ 1.1
10 R6	161	312	0	19	35	41	.4	1.4	7.2	6.0	+ 1.2
11 R8	162	313	0	20	39	38	1.8	.3	3.7	4.1	- .4
12 R9	163	314	0	22	41	37	1.8	.8	4.1	4.8	- .7
13 R10	164	315	0	18	33	41	.4	1.3	7.8	5.8	+ 2.0

Table 3. -(Continued)

Strain pedigree	Strain number 1936	Strain number 1937	Mean percent of plants tasseled on July 12	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 10 (inches)	Mean number tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
COUNTRY GENTLEMAN INBRED LINES Continued											
Seed obtained from Illinois State Agr. Exp. Sta. Fourteen strains (Continued)											
14 R15	165	316	5	16	38	37	1.6	1.2	6.3	6.0	+ .3
Seed obtained from Purdue Agr. Exp. Station (G.M.Smith, U.S.Bureau Plant Industry) Ten strains											
1 8344	166	377	0	22	33	39	1.8	1.8	7.5	5.8	+ 1.7
2 8098	167	366	0	23	39	44	2.2	1.2	7.0	4.9	+ 2.1
3 22-2-2	168	-	18	15	32	39	.7	1.2	6.9	6.5	+ .4
4 FR 34	169	-	0	25	39	37	2.2	.3	2.8	3.6	- .8
5 7710 (7)1	170	358	0	26	38	38	.6	.8	3.4	4.5	- 1.1
6 8225 (6) 1-2-1	171	-	0	20	36	39	3.4	2.5	6.4	6.7	- .3
7 348 (2) 13	172	-	0	23	37	44	.6	1.1	5.2	5.1	+ .1
8 6355	173	349	0	20	33	40	1.6	1.0	8.5	4.9	+ 3.6
9 7212 (8)1	174	-	0	18	38	40	1.5	1.4	4.8	5.9	- 1.1
10 8203	175	379	0	18	34	44	1.6	.8	5.4	4.8	+ .6
Group 3. EVERGREEN INBRED LINES (Forty-seven strains - 44 tested)											
Seed obtained from Purdue Agr. Exp. Sta. (G.M.Smith, U.S.Bureau Plant Industry) Ten strains											
1 119-2-4	176	411	7	15	36	47	1.8	.7	4.8	5.1	- .3
2 4-6-1	177	403	5	17	33	46	1.9	1.8	8.8	6.3	+ 2.5
3 99 (10) 1	178	405	0	22	36	43	1.4	.7	9.0	5.4	+ 3.6
4 1101-1-1-1	179	410	0	20	38	42	1.9	.8	3.4	4.7	- 1.3
5 V4 (6) 1	180	404	0	20	36	44	.4	.5	3.4	4.6	- 1.2
6 1008 (7) 2	181	406	0	21	39	42	1.6	.4	5.9	4.2	+ 1.7
7 1099 (10)1	182	409	0	26	39	42	1.8	.7	4.8	4.0	+ .8
8 1014-2-1	183	408	12	15	30	43	1.7	1.2	4.9	5.8	- .9
9 1009-8-2	184	-	0	19	35	35	3.3	.5	2.5	4.0	- 1.5
10 1009-2	185	407	0	20	38	35	3.0	.2	1.6	3.7	- 2.1

Table 3. - (Continued)

Strain pedigree	Strain number 1936	Strain number 1937	Mean percent of plants tasseled on July 12	Mean number of days after June 30, to appearance on 50 percent of plants of Tassels	Mean number of days after June 30, to appearance on 50 percent of plants of Silks	Mean plant height on July 10 (inches)	Mean number tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
EVERGREEN INBRED LINES (Continued)											
Seed obtained from Illinois State Agr. Exp. Sta. (Dr. W. A. Huelsen) Three strains											
1 R11	186	383	0	21	37	39	2.2	.4	2.4	4.0	- 1.6
2 R13	187	384	0	20	38	38	2.9	.4	2.8	4.0	- 1.2
3 R14	188	385	0	22	34	44	1.3	.9	5.3	4.6	+ .7
Seed obtained from Maryland State Agr. Exp. Sta. (Dr. R.G.Rothgeb) Three strains											
1 H57-1-3-1-2	189	-	0	20	37	51	1.9	1.5	4.7	5.5	- .8
2 H126-3-3-1-2	190	-	0	20	40	46	2.2	1.0	5.4	4.9	+ .5
3 H146-1-1-1-1	191	393	0	24	42	44	1.1	.9	4.4	4.8	- .4
Seed obtained from Ohio State Agr. Exp. Sta. (Dr. J.B.Park) Fourteen strains											
1 4b	192	-	0	20	41	39	2.3	.6	4.0	4.5	- .5
2 7 c	193	-	18	14	35	43	2.0	2.2	6.4	7.7	- 1.3
3 20 c	194	399	0	22	43	41	3.8	.5	7.4	3.8	+ 3.6
4 27 d	195	-	2	17	38	38	2.4	1.6	6.4	6.2	+ .2
5 27 e	196	400	0	19	35	43	1.5	1.2	3.8	5.4	- 1.6
6 33 e	197	-	0	17	38	38	3.0	1.1	5.4	5.2	+ .2
7 22 h	198	-	0	19	37	36	1.4	.5	3.7	4.6	- .9
8 sN 211-1-1-4	199	-	0	20	44	38	1.2	.9	3.8	5.4	- 1.6
9 sN 225-2-1-6	200	-	58	13	30	39	.9	1.2	7.0	7.8	- .8
10 sN 229-1-1-4	201	-	0	16	33	44	1.2	.6	5.9	4.8	+ 1.1
11 sN 238-1-1-6	202	-	0	20	35	42	2.1	.7	9.0	4.4	+ 4.6
12 sN 239-1-1-5	203	-	2	16	32	42	1.6	1.2	6.2	5.6	+ .6
13 sN 246-1-1-7	204	-	5	16	31	46	.7	.4	6.0	4.6	+ 1.4
14 sN 264-1-1-3	205	-	0	21	42	43	2.1	.9	6.4	4.9	+ 1.5

Table 3. - (Continued)

Strain pedigree	Strain number 1936	Strain number 1937	Mean percent of plants tasseled on July 12	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 10 (inches)	Mean number tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10	11 **	12 ***
EVERGREEN INBRED LINES (Continued)											
Seed obtained from Michigan State Agr. Exp. Sta. (Dr. C. H. Mahoney) Five strains											
1 351809	206	-	38	14	30	32	2.4	1.5	5.1	7.2	- 2.1
2 351810	207	-	Insufficient stand for testing				-	-	-	-	-
3 351813	208	396	12	16	32	33	1.0	1.1	5.8	6.1	- .3
4 351812	209	-	Insufficient stand for testing				-	-	-	-	
5 351827	210	-	Insufficient stand for testing				-	-	-	-	
Seed obtained from Iowa State Agr. Exp. Sta. (Dr. E. S. Haber) Seven strains											
1 1333	211	392	0	24	40	42	.6	.8	10.4	4.8	+ 5.6
2 777	212	389	0	27	40	42	.6	.8	6.7	4.4	+ 2.3
3 1068	213	-	0	30	43	36	.8	.2	2.4	3.5	- 1.1
4 1248	214	391	3	18	33	47	1.4	.9	3.8	5.0	- 1.2
5 261	215	387	0	22	40	32	.0	.7	7.4	5.2	+ 2.2
6 1071	216	390	0	28	45	37	1.9	.3	1.6	3.6	- 2.0
7 191	217	386	22	16	30	39	0	1.1	4.6	6.4	- 1.8
Seed obtained from Conn. State Agr. Exp. Sta. (Dr. W. R. Singleton) Five strains											
1 C-63	218	-	0	21	43	39	1.9	.6	3.9	4.6	- .7
2 C-77	219	-	2	19	36	40	1.8	1.6	5.3	6.0	- .7
3 C-78	220	380	22	16	31	40	1.2	1.6	11.0	6.9	+ 4.1
4 C-85	221	381	8	17	34	38	2.2	1.6	10.1	6.2	+ 3.9
5 C-656	222	382	0	15	34	43	1.8	.9	4.0	5.2	- 1.2

Table 3. - (Continued)

Strain pedigree	Strain number 1936	Strain number 1937	Mean percent of plants tasseled on July 12	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 10 (inches)	Mean number tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
B. HYBRID STRAINS											
Group 4 - Bantam Hybrid Strains (Twenty-two strains)											
Seed obtained from Iowa State Agr. Exp. Sta. (Dr. E. S. Haber) Five strains											
1 13 X 45	223	416	28	14	28	52	1.7	1.6	7.8	7.1	+ .7
2 1804 X 45	224	-	92	9	23	49	2.7	.8	8.1	7.7	+ .4
3 51 X 36	225	-	8	15	28	48	3.1	.5	4.7	4.2	+ .5
4 51 X 30	226	-	5	16	28	44	2.4	1.1	2.9	5.1	- 2.2
5 G. Sunshine X 45	227	-	100	6	22	50	2.6	1.9	6.7	9.8	- 3.1
Seed obtained from Michigan State Agr. Exp. Sta. (Dr. C. H. Mahoney) Six strains											
1 351525 X 351085	228	428	8	18	31	42	1.5	1.5	4.3	6.0	- 1.7
2 351526 X 351085	229	429	2	18	31	45	1.6	.6	3.7	4.4	- .7
3 351540 X 351085	230	430	0	20	32	40	2.7	.9	3.1	4.4	- 1.3
4 351544 X 351085	231	432	18	16	30	36	2.3	.4	4.6	4.8	- .2
5 351807 X 351085	232	-	45	14	28	38	2.8	.5	3.3	5.7	- 2.4
6 351085 X 351542	233	431	12	16	29	37	2.4	.9	4.8	5.2	- .4
Seed obtained from Minn. State Agr. Exp. Sta. (Dr. I. J. Johnson) Ten strains											
1 1-34 X Gold. Bantam ...	234	444	98	7	22	41	3.3	2.2	12.4	10.0	+ 2.4
2 6-34 X Gold. Bantam ...	235	445	40	7	24	46	3.5	2.0	7.1	7.9	- .8
3 13-34 X Gold. Bantam ...	236	-	98	4	20	44	2.6	1.8	11.6	9.8	+ 1.8
4 14-34 X Gold. Bantam ..	237	446	100	5	21	41	2.8	2.2	9.8	10.4	- .6
5 23-34 X Gold. Bantam ..	238	447	98	6	23	41	2.9	1.8	10.9	9.7	+ 1.2
6 26-34 X Gold. Bantam ..	239	448	100	3	20	44	2.8	1.4	8.3	9.3	- 1.0
7 27-34 X Gold. Bantam ..	240	-	100	3	19	45	2.4	2.0	10.2	10.2	.0
8 34-34 X Gold. Bantam...	241	-	92	7	23	40	2.6	.7	8.3	7.9	+ .4
9 42-28 X Gold. Bantam ..	242	450	100	5	20	44	2.8	3.0	10.9	11.4	- .5
10 38-28 X Gold. Bantam ..	243	449	100	3	19	44	2.6	2.2	8.0	10.5	- 2.5

Table 3. - (Continued)

Strain pedigree	Strain number 1936	Strain number 1937	Mean percent of plants tasseled on July 12	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 10 (inches)	Mean number tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	7(E)	9(F)	10 (X)	11**	12***
BANTAM HYBRID STRAINS (Continued)											
Seed obtained by purchase (Commercial production) One strain											
1 Ea. Bant. X P39	244	-	100	4	20	46	2.2	2.3	9.8	10.6	- .8
Group 5. COUNTRY GENTLEMAN HYBRID STRAINS (Sixteen strains)											
Seed obtained from Iowa State Agr. Exp. Sta. (Dr. E. S. Haber) Three strains											
1 900 X 1445	245	485	0	19	33	48	1.4	1.1	3.6	5.0	- 1.4
2 900 X 1434	246	496	0	20	34	53	1.8	1.2	4.3	4.9	- .6
3 1389 X 1434	247	490	0	21	35	53	.8	.8	3.4	4.6	- 1.2
Seed obtained from Illinois State Agr. Exp. Sta. (Dr. W. A. Huelsen) Thirteen strains											
1 1 X 6	248	458	0	17	32	49	1.0	.9	5.3	5.0	+ .3
2 5 X 15	249	468	5	17	34	46	1.3	.6	3.4	4.8	- 1.4
3 8 X 6	250	472	2	18	33	47	1.6	.5	7.2	4.3	+ 2.9
4 3 X 6	251	460	0	19	33	45	1.9	.7	5.5	4.4	+ 1.1
5 5 X 10	252	466	0	18	33	48	1.1	.5	3.4	4.4	- 1.0
6 8 X 3	253	471	0	19	34	45	2.2	1.1	4.0	4.9	- .9
7 8 X 15	254	475	0	18	35	46	2.8	1.3	5.1	5.2	- .1
8 9 X 1	255	476	0	19	34	46	1.6	.9	4.8	4.8	.0
9 9 X 3	256	477	0	19	34	47	2.3	.8	4.3	4.4	- .1
10 9 X 6	257	479	0	19	34	46	1.7	.9	4.1	4.8	- .7
11 9 X 4	258	478	2	17	33	44	2.0	1.1	5.7	5.2	+ .5
12 9 X 10	259	481	0	18	32	47	1.5	1.2	4.5	5.2	- .7
13 10 X 15	260	484	2	16	32	45	1.9	1.4	5.7	5.7	.0

Table 7. (Continued)

Strain pedigree	Strain number 1936	Strain number 1937	Mean percent of plants tasseled on July 12	Mean number of days after June 30 to appearance on 50 percent of plants of Tassels	Mean number of days after June 30 to appearance on 50 percent of plants of Silks	Mean plant height on July 10 (inches)	Mean number tillers per plant	Mean number borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
GROUP 6. EVERGREEN HYBRID STRAINS (Fifteen strains)											
Seed obtained from Iowa State Agr. Exp. Sta. (Dr. E.S.Haber) Eight strains											
1 251 X 1248	261	517	2	18	33	50	1.4	.7	4.0	4.6	- .6
2 1363 X 1248	262	522	0	19	34	52	.9	1.3	8.0	5.4	+ 2.6
3 12E X 1248	263	515	8	16	31	54	.9	1.2	4.6	5.7	- 1.1
4 1068 X 777	264	-	0	24	38	52	1.1	.3	2.9	3.6	- .7
5 12E X 191	265	524	8	17	30	52	.8	1.1	4.4	5.5	- 1.1
6 1363 X 191	266	523	15	16	31	53	.7	.6	3.8	5.1	- 1.3
7 777 X 191	267	-	8	17	30	51	1.9	1.2	5.8	5.3	+ .5
8 1071 X 191	268	-	2	23	39	47	1.4	.5	3.8	4.1	- .3
Seed obtained from Maryland State Agr. Exp. Sta. (Dr. R. G. Rothgeb) Four strains											
1 EV. X H57-1-3-1	269	-	2	18	37	52	2.3	1.1	4.9	5.1	- .2
2 EV. X H143-1-1-1	270	-	0	21	39	54	1.4	.9	2.9	4.7	- 1.8
3 EV. X H126-3-3-1	271	-	8	16	34	59	1.4	1.8	6.4	6.5	- .1
4 Hopeland (Variety)	272	528	0	19	35	54	1.8	1.2	4.8	5.1	- .3
Seed obtained from Illinois Agr.Exp. Sta. (Dr. W. A. Huelsen) Three strains											
1 11 X 14	273	507	0	20	33	49	2.2	1.4	3.1	5.2	- 1.5
2 13 X 11	274	508	2	17	34	52	2.5	1.5	4.0	5.6	- 1.6
3 13 X 14	275	509	0	19	33	50	2.1	1.9	5.5	6.0	- .5
General average			26.9	15.8	31.8	41.8	1.89	1.14	6.20	5.20	
Standard deviation (strain means)			39.164#	6.270#	6.510#	5.539#	.872#	.575#	2.664#		
Standard error (strain means)			5.501	.736	.717	1.171	.217	.379	.865		
Least significant difference between strain means			15.287	2.045	1.992	3.254	.603	1.067	2.404		

Table 3. (Continued)

---

* Measurements in each replicate based on ten plants, totalling forty plants per strain in the experiment, with some exceptions.

** Calculated by the following equation based on the data in columns 4, 5, 6, 7, 8, 9, and 10:

Expected population = 5.15778 + (+.03121)A +(-.09970)B +(+.04397)C +(-.01807)D +(-.26551)E +(+1.43941)F.

The mean results for each strain, in the columns corresponding to the respective letters in the equation, are substituted for the letters.

*** Error of estimate. Standard error of estimate is 1.7522.

\# Highly significant.

Table 4. - Data relating to Bantam Inbred sweet corn strains tested in 1937, near Toledo, Ohio, for resistance to the European corn borer. Mean results based on four replicated tests in random blocks.*

Number	Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 15	Number of days after June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infest.): Observed	Expected	Difference
	1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
Obtained from Conn. Agr. Exp. Sta. (Dr. W. R. Singleton) Three strains												
1	C-2	276	133	83.00	13.50	29.00	35.75	23.25	2.600	7.875	6.989	+ .886
2	C-6	277	134	100.00	7.75	20.00	25.25	24.25	2.225	9.250	7.957	+1.293
3	C-7	278	135	Insufficient stand for testing				-	-	-	-	-
Obtained from Iowa Agr. Exp. Sta. (Dr. E. S. Haber) Nine strains												
1	9	279	104	5.00	21.00	34.00	34.50	19.75	.725	1.750	3.214	-1.464
2	13	280	102	10.00	20.00	33.00	36.00	19.75	1.175	2.150	3.964	-1.814
3	30	281	-	3.50	22.00	34.00	33.75	22.00	.675	3.250	2.877	+ .373
4	40	282	-	.00	27.25	39.25	39.75	17.25	.350	3.475	1.826	+1.649
5	42	283	-	.00	22.75	33.00	38.00	22.25	.625	3.750	1.958	+1.791
6	45	284	101	12.50	20.50	32.75	35.25	22.25	.600	1.750	2.458	- .708
7	47	285	106	7.50	23.00	34.75	35.50	19.50	.550	1.900	2.706	- .806
8	51	286	105	2.50	20.25	32.00	33.50	25.75	.875	3.425	2.770	+ .655
9	1804	287	103	92.50	11.50	24.00	27.00	18.75	.775	8.350	5.282	+3.068
Obtained from Mich. Agr. Exp. Sta. (Dr. C. H. Mahoney) Eight strains												
1	351828	288	119	85.00	13.25	27.25	30.50	17.75	.725	.950	4.669	-3.719
2	351249	289	121	Insufficient stand for testing				-	-	-	-	-
3	351818	290	118	Insufficient stand for testing				-	-	-	-	-
4	351820	291	116	72.50	14.50	25.25	27.25	23.00	1.100	4.825	5.179	- .354
5	351821	292	-	25.25	20.00	37.00	34.75	17.75	.775	3.975	3.702	+ .273
6	351826	293	117	100.00	9.50	22.50	27.00	19.25	1.400	8.200	6.617	+1.583
7	351823	294	-	100.00	10.75	23.75	26.25	29.25	1.850	5.700	6.177	- .477
8	351825	295	122	100.00	9.25	19.00	22.25	21.50	1.425	8.675	7.160	+1.515

Table 4. -(Continued)

Number	Strain pedigree	Number strain 1937	Number strain 1936	Percent of plants tasseled on July 15	Number of days after June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest)	Mean number of borers per plant (Additional hand infest.): Observed	Expected	Difference
1		2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11 **	12***
Obtained from Minn. Agr. Exp. Sta. (Dr. I. J. Johnson) Eight strains												
1.	1-34	296	123	92.50	12.25	25.75	28.75	17.75	1.250	6.450	6.172	+ .278
2	6-34	297	124	92.50	11.50	24.50	27.25	25.00	.750	3.900	4.208	- .308
3	13-34	298	125	100.00	10.25	24.50	28.25	18.50	.500	2.425	4.538	-2.113
4	14-34	299.	126	90.00	12.50	25.75	28.00	19.75	1.000	6.925	5.430	+1.495
5	23-34	300	127	100.00	11.75	25.75	31.75	22.75	1.175	5.350	4.738	+ .612
6	26-34	301	128	100.00	9.00	21.75	27.75	22.75	1.425	2.175	5.993	-3.818
7	38-28	302	132	87.50	12.75	26.00	29.00	22.50	1.875	6.250	6.731	- .481
8	42-28	303	131	90.00	12.50	25.25	27.50	24.25	2.050	6.700	7.121	- .421
Obtained from Ohio Agr. Exp. Sta. (Dr. J. B. Park) One strain												
1	sG 202-1-1-1	304	-	40.00	16.50	31.00	35.75	21.25	1.075	4.900	3.718	+1.182
Obtained from Purdue Agr. Exp. Sta. (G.M.Smith, U.S.Bureau Plant Industry) Three strains												
1	1313-1-1-1	305	142	87.50	13.00	27.75	32.50	27.00	1.075	4.750	3.654	+1.096
2	P51	306	147	37.50	17.25	31.50	34.25	26.00	2.175	3.975	5.643	-1.668
3	P39	307	145	57.50	15.25	30.50	33.00	21.25	1.200	4.975	4.574	+ .401
Average				61.18	15.22	28.29	31.24	21.79	1.172	4.759	4.759	
Standard Deviation (Strain means)				40.22#	5.12#	5.17#	4.35#	3.04#	.582#	2.339#		
Standard Error (Strain means)				6.52	.90	1.28	1.32	1.04	.352	.877		
Least significant dif. between strain means				18.35	2.54	3.61	3.72	2.91	.991	2.469		

* Measurement in each replicate based on 10 plants, totalling 40 plants per strain in the experiment, with some exceptions.

** Calculated by the following equation based on the data in columns 4, 7, 8, 9, and 10: Expected Population = 10.77046 +(+.00546)A +(-.17663)D +(-.15604)E +(+2.19524)F. The mean results for each strain, in the columns corresponding to the respective letters in the equation are substituted for the letters in succession.

\# Highly significant.

*** Error of estimate. Standard error of estimate is 1.7298.

Table 5.- - Data relating to Bantam Hybrid sweet corn strains tested in 1937, near Toledo, Ohio, for resistance to the European corn borer. Mean results based on four replicated tests in random blocks.*

Number	Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 15	Number of days after June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infest.): Observed	Expected	Difference
	1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
Obtained from Conn. Agr. Exp. Sta. (Dr. W. R. Singleton) Three strains												
1	Whip Cross 6.2	412	-	100.00	7.50	18.25	25.25	34.50	2.450	5.325	6.051	- .726
2	Whip Cross 7.2	413	-	92.50	11.50	23.50	27.75	30.00	1.375	4.775	4.804	- .029
3	Span Cross 85	414	-	100.00	10.75	20.50	22.75	33.50	1.350	5.625	4.584	+ 1.041
Obtained from Iowa Agr. Exp. Sta. (Dr. E. S. Haber) Seven strains												
1	Harris B. x 45	415	-	85.00	11.50	21.75	25.50	30.50	1.075	3.825	4.297	- .472
2	13 x 45	416	223	40.00	17.75	30.25	33.50	29.50	.725	2.925	3.074	- .149
3	P 1339 x 45	417	-	72.50	15.00	27.00	31.25	27.75	.900	3.700	3.985	- .285
4	P 1344 x 45	418	-	45.00	16.50	29.25	32.50	30.50	1.025	3.025	3.487	- .462
5	P 1351 x 45	419	-	75.00	13.75	25.00	27.25	33.25	1.075	3.925	3.803	+ .122
6	30 x 42	420	-	25.00	17.50	28.00	30.50	32.75	.575	2.775	2.432	+ .343
7	51 x 26	421	-	47.50	16.75	28.25	30.75	32.00	1.000	4.950	3.334	+ 1.616
Obtained from Mich. Agr. Exp. Sta. (Dr. C. H. Mahoney) Twenty strains												
1	1828 x 1818	422	-	85.00	13.50	25.50	27.50	25.25	1.675	5.075	5.411	- .336
2	1828 x 1819	423	-	97.50	11.00	20.25	24.00	30.50	.825	2.750	4.158	- 1.408
3	1828 x 1820	424	-	97.50	11.75	20.75	25.00	30.75	1.275	3.025	4.655	- 1.630
4	1828 x 1822	425	-	100.00	10.25	20.25	25.00	30.75	.775	2.850	4.145	- 1.295
5	1828 x 1824	426	-	100.00	10.00	21.00	25.00	31.25	.950	3.700	4.332	- .632
6	1807 x 1820	427	-	80.00	14.00	25.00	28.25	27.75	.500	4.050	3.630	+ .420
7	351525 x 351085	428	288	.00	22.50	35.00	34.00	23.75	.650	2.225	2.771	- .546
8	351526 x 351085	429	229	10.00	24.50	36.75	36.25	24.50	.525	2.550	2.548	+ .002
9	351540 x 351085	430	230	Insufficient stand for testing				-	-	-	-	
10	351085 x 351542	431	233	Insufficient stand for testing				-	-	-	-	
11	351544 x 351085	432	231	Insufficient stand for testing				-	-	-	-	
12	(1085 x 1525)X(1828x1821)	433	-	45.00	17.00	30.25	33.50	27.75	.475	3.025	3.022	+ .003
13	(1085 x 1525)X(1085x1526)	434	-	20.50	19.00	33.00	35.75	26.00	1.100	4.000	3.564	+ .436
14	(1085 x 1525)X(1085x1544)	435	-	22.50	21.00	34.00	35.00	23.25	1.200	3.050	3.849	- .799
15	(1085 x 1542)X(1085x1525)	436	-	15.00	18.50	31.25	32.00	29.50	.575	2.650	2.555	+ .095

Table 5. - (Continued)

Number	Strain pedigree	Strain number 1937	Strain number 1938	Percent of plants tasseled on July 15	Number of days after June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
	1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10	11**	12***
Obtained from Mich. Agr. Exp. Sta. (Dr. C. H. Mahoney) Twenty strains. (Continued)												
16	(1085x1542)X(1085x1526) ...	437	-	2.50	23.25	34.25	35.00	25.50	.900	3.025	2.910	+ .115
17	(1085x1544)X(1085x1526) ...	438	-	12.50	23.25	35.25	37.00	24.25	.200	1.775	2.266	- .491
18	(1085x1544)X(1085x1540) ...	439	-	00	23.50	35.25	35.75	23.75	.600	2.675	2.652	+ .023
19	(1828x1821)X(1085x1526) ...	440	-	40.00	16.25	26.75	29.75	30.25	.725	2.525	3.091	- .566
20	(1828x1821)X(1085x1542) ...	441	-	65.00	14.50	25.75	29.75	29.00	.500	5.000	3.314	+ 1.686
Obtained from Purdue Agr. Exp. Sta. (G. M. Smith, U.S.Bureau of Plant Industry) Two strains												
1	P39 X P51	442	-	72.50	14.75	28.00	31.00	27.75	.500	4.200	3.500	+ .700
2	(1313 x P51) X P 39	443	-	82.00	13.00	26.50	30.00	30.50	1.200	4.000	4.333	- .333
Obtained from Minn. Agr. Exp. Sta. (Dr. I. J. Johnson) Thirteen strains												
1	1-34 X G. Bant.	444	234	92.50	12.25	24.50	27.50	24.00	1.100	5.000	4.965	+ .035
2	6-34 X G. Bant	445	235	97.50	12.25	24.25	27.75	26.25	.825	4.500	4.474	+ .026
3	14-34 X G.Bant	446	237	100.00	10.25	21.25	24.50	28.25	2.125	8.375	6.058	+2.317
4	23-34 X G. Bant.	447	238	95.00	11.75	22.75	26.75	28.00	1.975	6.600	5.750	+ .850
5	26-34 X G. Bant.	448	239	100.00	10.25	22.25	26.75	27.25	.875	3.825	4.588	- .763
6	38-28 X G.Bant.	449	243	100.00	8.50	19.75	22.50	28.75	1.475	5.250	5.300	- .050
7	42-28 X G. Bant.	450	242	87.50	12.50	24.50	28.25	24.75	1.400	4.700	5.199	- .499
8	6-34 X 23-34	451	-	97.50	10.00	21.25	25.75	30.75	1.850	5.475	5.472	+ .003
9	6-34 X 42-28	452	-	100.00	10.00	20.75	24.75	27.75	2.225	5.500	6.242	- .742
10	6-34 X 38-28	453	-	100.00	9.50	21.00	25.00	25.25	1.100	4.800	5.094	- .294
11	23-34 X 38-28	454	-	100.00	10.50	21.75	26.50	26.75	.975	4.925	4.745	+ .180
12	23-34 X 42-28	455	-	97.50	11.75	23.00	28.25	26.25	1.075	5.675	4.815	+ .860
13	38-28 X 42-28	456	-	97.50	10.25	21.25	24.50	26.50	.625	5.950	4.316	+1.634
	Average			68.93	14.28	25.83	28.93	28.26	1.055	4.133	4.133	

Table 2.- (Continued)

Standard deviation (strain mean)	35.19#	4.57#	5.16#	4.06#	2.95#	.511#	1.357#
Standard error (strain mean)	9.69	1.17	1.26	1.52	2.37	.434	.737
Least significant difference between strain means	27.12	3.26	3.52	4.26	6.65	1.215	2.063

* Measurements in each replicate based on ten plants, totalling forty plants per strain in the experiment, with some exceptions.

** Calculated by the following equation based on the data in columns 4, 5, 8, 9, and 10:
Expected Population = 5.40429 + (+.01158)A + (-.05694)B + (-.09110)E + (+1.24836)F. The mean results for each strain in the columns corresponding to the respective letters in the equation, are substituted for the letters in succession.

*** Error of estimate. Standard error of estimate is 0.8704.

\# Highly significant.

Table 5.- Data relating to Country Gentleman and Evergreen Inbred sweet corn strains tested in 1937, near Toledo, Ohio, for resistance to the European corn borer. Mean results based on four replicated tests in random blocks.*

Number	Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 26	Number of days from June 30 to appearance on 50 percent of plants of Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation) Observed	Expected	Difference
1		2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
A. Country Gentleman Inbred Strains												
Obtained from Illinois Agr. Exp. Sta. (Dr. W. A. Huelsen) Eleven strains												
1	R1	308	157	71.25	25.00	37.50	43.25	23.75	.925	4.825	6.756	-1.931
2	R3	309	158	75.00	20.75	33.75	36.25	28.50	1.175	6.050	7.339	- 1.289
3	R4	310	159	92.50	20.50	34.50	39.50	20.75	.975	7.750	7.809	- .059
4	R5	311	160	90.00	20.75	34.75	36.75	28.25	1.400	7.150	7.712	- .562
5	R6	312	161	92.50	22.25	35.00	36.75	26.00	1.900	10.900	8.487	+2.413
6	R8	313	162	60.00	25.50	38.75	40.75	24.25	1.350	5.625	6.881	-1.256
7	R9	314	163	52.50	26.75	38.50	43.00	23.75	1.100	7.225	6.534	+ .691
8	R10	315	164	97.50	20.50	33.75	35.50	26.75	1.500	9.575	8.207	+1.368
9	R15	316	165	100.00	19.25	34.75	36.00	21.75	1.125	5.650	7.997	-2.347
10	124-318	317	152	90.00	22.50	36.00	38.75	22.75	.975	6.625	7.401	- .776
11	159-121	318	-	88.75	20.00	33.25	36.50	22.75	1.125	8.700	7.978	+ .722
Obtained from Iowa Agr. Exp. Sta. (Dr. E. S. Haber) Five strains												
1	900	319	149	65.00	25.75	38.00	45.50	18.25	.900	8.200	6.953	+1.247
2	1434	320	150	5.50	33.25	41.75	43.25	30.75	.925	4.250	4.609	- .359
3	1445	321	151	42.50	29.25	39.75	43.00	23.50	.750	5.625	5.784	- .159
4	1612	322	-	47.50	27.50	39.75	43.75	24.50	.875	8.350	5.941	+2.409
5	1620	323	148	45.00	27.50	41.50	44.25	21.25	1.500	6.100	6.640	- .540
Obtained from Purdue Agr. Exp. Sta. (G. M. Smith, U.S. Bureau Plant Industry) Fifty-six strains												
1	FR7 (4)1	324	-	81.75	21.50	35.00	39.25	22.75	1.000	7.425	7.456	- .031
2	FR14(3)2	325	-	67.50	24.25	37.50	41.50	21.50	1.175	8.100	7.168	+ .932
3	FR17 (5)1	326	-	67.50	25.50	39.25	40.25	19.50	.950	4.100	6.774	-2.674
4	FR22 (4)1	327	-	94.50	20.75	37.00	38.50	23.50	1.025	5.200	7.327	-2.127
5	C 1(5) 1	328	-	Insufficient stand for testing				-	-	-	-	

Table 6.- (Continued)

Number	Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 26	Number of days from June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
	1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
Obtained from Purdue Agr. Exp. Sta. (G. M. Smith, U.S.Bureau Plant Industry) Fifty-six strains (Continued)												
6	C 8(4)1	329	-	70.00	23.75	36.75	39.00	21.25	2.225	8.000	8.621	- .621
7	C 12(2)1	330	-	85.00	20.75	35.50	38.75	30.25	2.975	9.925	9.305	+ .620
8	S 10(5)1	331	-	100.00	21.00	33.75	34.25	24.00	1.175	7.725	8.046	- .321
9	S 18(5)1	332	-	70.00	25.00	36.75	43.50	22.75	1.100	6.175	7.136	- .961
10	S 19(5)1	333	-	87.50	21.00	35.50	37.75	22.75	.850	8.525	7.285	+ 1.240
11	S 29(4)1	334	-	92.50	21.75	35.25	41.25	24.25	1.200	7.725	7.719	+ .006
12	S 35(5)1	335	-	80.00	21.00	36.00	39.00	23.75	1.100	11.275	7.329	+ 3.946
13	S 36(5)1	336	-	57.50	26.00	37.50	36.75	23.75	1.475	6.550	7.219	- .669
14	S 37(5)1	337	-	85.00	22.50	37.25	38.25	21.00	.425	8.325	6.591	+1. 734
15	W 7 (4)1	338	-	67.50	27.75	38.75	42.75	22.75	.525	4.425	6.094	- 1.669
16	W 13(6)1	339	-	65.00	27.00	41.00	45.25	20.50	1.250	7.000	6.768	+ .232
17	29 (8)3	340	-	87.50	22.50	36.00	38.00	22.00	1.175	7.525	7.662	- .137
18	29 (11)1	341	-	100.00	15.25	30.25	32.00	22.50	1.275	9.075	8.802	+ .273
19	30 (10)2	342	-	95.00	22.50	35.50	37.50	18.00	1.075	8.875	8.018	+ .857
20	32 (8) 2	343	-	90.00	20.00	34.50	39.50	27.50	.775	7.825	7.039	+ .786
21	348(2) 2	344	-	80.00	24.00	37.00	39.00	24.75	.775	4.250	6.709	- 2.459
22	900(6) 1	345	-	77.50	22.50	35.00	38.00	26.75	1.275	9.325	7.439	+ 1.886
23	937(4) 1	346	-	100.00	17.00	31.50	36.50	24.75	.975	7.200	8.085	- .885
24	943-2-1-1-1	347	-	100.00	17.50	33.75	33.00	25.00	1.300	10.075	8.127	+ 1.948
25	6267(10)2	348	-	67.50	23.75	35.75	44.25	23.50	1.600	7.900	7.806	+ .094
26	6355	349	173	72.50	23.25	35.50	39.00	26.25	1.850	10.000	8.027	+ 1.973
27	6546 (9)2	350	-	37.25	23.00	37.25	40.00	24.00	.525	8.925	6.531	+ 2.394
28	6532 (8)1	351	-	80.00	25.25	37.25	39.75	27.25	.825	6.150	6.552	- .402
29	6606 (9)1	352	-	57.50	26.25	37.50	42.25	24.00	.500	6.375	6.008	+ .367
30	6609 (9)2	353	-	100.00	19.00	37.25	36.50	26.75	1.325	8.425	7.506	+ .919
31	6609 (10)1	354	-	87.50	24.00	36.00	41.50	25.75	1.900	8.500	8.278	+ .222
32	6691 (9)1	355	-	80.75	23.25	36.00	37.00	30.50	1.400	6.600	7.220	- . 620
33	7620 (8)1	356	-	80.00	24.50	35.25	41.50	24.25	1.375	6.150	7.742	- 1.592
34	7685 (6)1	357	-	55.00	27.25	39.50	43.00	24.00	1.050	9.225	6.343	+ 2.882

Table 6.- (Continued)

Number	Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 26	Number of days from June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
	1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10 (X)	11**	12***
Obtained from Purdue Agr. Exp. Sta. (G. M. Smith, U.S.Bureau Plant Industry) Fifty-six strains (Continued)												
35	7710(7)1	358	170	37.50	30.25	38.75	42.50	22.25	1.250	5.525	6.560	- 1.035
36	7763 (6)1	359	-	82.50	22.75	36.00	40.00	25.25	1.300	8.725	7.504	+ 1.221
37	8034 (5)1	360	-	94.50	18.75	33.50	37.50	21.50	.975	9.575	7.935	+ 1.640
38	8035 (6)1.....	361	-	45.00	28.00	38.00	40.50	22.50	.625	4.500	6.004	- 1.504
39	8050 (5)1	362	-	100.00	17.25	31.25	32.00	25.25	.600	8.825	7.627	+ 1.198
40	8065 (7)1	363	-	45.00	27.75	37.50	42.00	21.75	.425	6.825	5.888	+ .937
41	8081 (6)1	364	-	77.50	22.25	36.25	40.75	19.75	1.350	8.875	7.848	+ 1.027
42	8083 (6)1	365	-	92.50	20.50	33.50	39.00	24.50	.975	10.400	7.688	+ 2.712
43	8098	366	167	82.50	23.00	37.75	42.00	27.75	.150	6.600	5.654	+ .946
44	8116 (5)1	367	-	70.00	25.50	37.75	41.50	27.00	1.300	6.625	6.924	- .299
45	8208 (6)1	368	-	100.00	16.50	30.50	36.25	25.50	.525	8.150	7.630	+ .520
46	8217 (5)1	369	-	100.00	19.75	33.75	35.00	25.25	1.075	7.900	7.833	+ .067
47	8223 (6)1	370	-	95.00	18.50	32.50	36.50	25.25	1.300	8.250	8.220	+ .030
48	8226 (6)1	371	-	92.50	18.75	34.25	38.00	20.25	2.025	8.000	9.167	- 1.167
49	8235 (7)1	372	-	80.00	25.00	36.00	39.50	29.00	.725	7.550	6.491	+ 1.059
50	8271 (6)1	373	-	100.00	18.25	33.25	36.50	20.00	.750	6.525	7.890	- 1.365
51	8272 (5)1-2	374	-	90.00	21.50	34.75	38.25	26.75	1.075	6.450	7.422	- .972
52	8298 (4)1	375	-	97.50	21.00	35.75	37.50	25.00	1.200	7.025	7.666	- .641
53	8339 (6)1	376	-	87.50	21.25	33.75	38.50	29.50	.600	8.550	6.754	+ 1.796
54	8344	377	166	80.00	24.00	35.50	36.75	24.50	2.325	11.275	8.849	+ 2.426
55	8488(4)1	378	-	97.50	19.50	35.00	36.25	25.50	.950	5.750	7.437	- 1.687
56	8203	379	175	82.50	22.25	34.75	39.00	27.50	1.000	9.725	7.162	+ 2.563

Table 6.- (Continued)

Number	Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 26	Number of days from June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
	1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
B. EVERGREEN INBRED STRAINS												
	Obtained from Conn. Agr. Exp. Sta. (Dr. W. R. Singleton) Three strains											
1	C-78	380	220	95.00	20.50	34.25	37.00	25.75	1.525	6.800	8.197	- 1.397
2	C-85	381	221	85.00	21.75	35.25	37.50	26.50	1.075	6.675	7.289	- .614
3	C-656	382	222	90.00	22.50	39.75	41.00	26.00	.475	5.475	5.992	- .517
	Obtained from Illinois Agr. Exp. Sta. (Dr. W. A. Huelsen) Three strains											
1	R11	383	186	82.50	24.75	37.50	38.25	26.50	1.525	8.350	7.539	+ .811
2	R13	384	187	77.50	24.50	36.50	39.50	28.25	1.075	6.450	6.860	- .410
3	R14	385	188	72.50	24.75	34.75	37.00	31.25	.750	5.875	6.432	- .557
	Obtained from Iowa Agr. Exp. Sta. (Dr. E. J. Haber) Seven strains											
1	191	386	217	100.00	18.50	32.00	34.50	26.25	1.300	6.325	8.299	- 1.974
2	261	387	215	Insufficient stand for testing				-	-	-	-	-
3	377	388	-	95.00	21.25	32.50	35.00	23.25	1.875	6.425	9.068	- 2.643
4	777	389	212	33.00	30.50	42.00	42.00	26.00	.350	4.525	4.631	- .106
5	1071	390	216	.00	32.25	47.50	50.00	21.00	.375	3.875	3.694	+ .181
6	1248	391	214	100.00	18.00	32.75	34.50	34.75	1.275	6.600	7.542	- .942
7	1363	392	211	57.50	27.75	41.25	46.75	22.75	.575	6.925	5.628	+ 1.297
	Obtained from Maryland Agr. Exp. Sta. (Prof. R. G. Rothgeb) Three strains											
1	H 146 -1-1-1-1	393	191	61.50	27.00	41.00	45.75	24.50	.675	6.625	5.722	+ .903
2	H 84 -1-2-1-1-4	394	-	20.25	32.50	44.75	46.25	23.50	.650	3.025	4.571	- 1.546
3	H 33 -1-2-2-1-4	395	-	58.75	26.75	40.50	43.25	19.00	.800	4.600	6.306	- 1.706

Table 6.-(Continued)

Number	Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 26	Number of days after June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
1	2		3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
	EVERGREEN INBRED STRAINS (Continued)											
Obtained from Mich. Agr. Exp. Sta. (Dr. C. H. Mahoney) Three strains												
1	351813	396	208	Insufficient stand for testing								
2	362117	397	-	90.00	21.75	34.25	35.75	30.25	.625	5.950	6.694	- .744
3	261 (Maize Amargo - Field corn)	398	-	22.50	32.00	41.00	42.75	17.00	.825	5.075	5.852	- .777
Obtained from Ohio Agr. Exp. Sta. (Dr. J. B. Park) Four strains												
1	20C	399	194	67.50	25.75	39.00	44.75	25.75	.525	6.175	5.840	+ .335
2	27e	400	196	62.50	23.25	37.25	40.25	27.50	1.025	5.550	6.512	- .962
3	sN 238-1-1-2	401	-	55.50	28.25	40.50	43.25	20.25	.800	5.700	6.166	- .466
4	sN 264-1-1-1	402	-	70.00	24.50	37.25	42.50	23.50	.825	5.225	6.671	-1.446
Obtained from Purdue Agr. Exp. Sta. (G. M. Smith, U.S.Bureau of Plant Industry) Nine strains												
1	4-6-1	403	177	100.00	18.50	33.25	36.75	31.00	1.275	5.875	7.738	-1.863
2	V4 (6)1	404	180	58.50	26.00	39.50	41.75	27.50	.975	4.475	6.052	-1.577
3	99 (10)1	405	178	72.50	24.50	34.25	39.00	26.75	.225	5.600	6.190	- .590
4	1008 (7)2	406	181	72.50	26.00	40.50	43.50	24.50	.575	6.525	5.843	+ .682
5	1009 -2	407	185	29.00	29.50	42.00	45.25	16.75	.700	6.225	5.666	+ .559
6	1014 (2)1	408	183	97.50	19.00	32.75	36.75	25.75	.900	6.275	7.695	-1.420
7	1099 (10)1	409	182	15.00	32.00	41.00	42.50	22.00	.525	6.175	5.009	+1.166
8	1101-1-1	410	179	100.00	21.50	37.75	38.00	28.75	1.350	7.900	7.317	+ .583
9	119 -2-4	411	176	92.50	19.00	34.25	40.00	27.75	1.225	6.200	7.647	-1.447
Average (C.Gent. and Evergreen strains)				75.72	23.41	36.54	39.64	24.56	1.060	7.075		
Standard deviation (Strain means)				22.70#	3.87#	3.05#	3.41#	3.27#	.459##	1.730#		
Standard error (Strain means)				10.73	1.47	1.18	1.56	2.11	.452	1.245		
Least significant difference between strain means				29.88	4.10	3.29	4.33	5.88	1.259	3.464		

Table 5.- (Continued)

---

* Measurements in each replicate based on ten plants, totalling forty plants per strain in the experiment, with some exceptions.

** Calculated by the following equation based on the data in columns 4, 6, 8, 9, and 10:
Expected population = 11.87932 + (+.01527)A + (-.15006)C + (-.07223)E + (+ 1. 22362)F. The mean results for each strain, in the columns corresponding to the respective letters in the equation, are substituted for the letters in succession.

*** Error of estimate. Standard error of estimate is 1.4060.

\# Highly significant.

\#\# Nonsignificant.

Table 7.- Data relating to Country Gentleman and Evergreen Hybrid sweet corn strains tested in 1937, near Toledo, Ohio, for resistance to the European corn borer. Mean results based on four replicated tests in random blocks.*

	Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 26	Number of days from June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
	1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10 (X)	11**	12***
A. COUNTRY GENTLEMAN HYBRID STRAINS												
	Obtained from Illinois Agr. Exp. Sta. (Dr. W. A. Huelsen) Twenty-eight strains											
1	1 X 3	457	-	81.25	22.25	35.50	38.75	26.50	1.025	6.450	6.012	+ .438
2	1 X 6	458	248	95.00	21.50	34.75	40.50	23.00	.925	6.425	6.779	- .354
3	1 X 10	459	-	84.75	22.25	35.50	39.75	23.75	.975	7.050	6.453	+ .597
4	3 X 6 Illinois	460	251	87.50	21.00	33.75	36.75	27.50	1.600	6.950	6.576	+ .374
5	3 X 6 Iowa	461	-	82.50	22.75	35.00	38.00	25.50	1.075	7.225	6.182	+ 1.043
6	3 X 6 Idaho	462	-	97.50	21.75	34.25	39.50	26.75	.500	6.775	5.864	+ .911
7	3 X 10	463	-	100.00	21.00	33.50	36.50	26.75	.750	7.375	6.192	+ 1.183
8	4 X 1	464	-	90.00	22.25	35.25	40.50	23.00	1.375	7.750	7.000	+ .750
9	4 X 3	465	-	100.00	18.50	32.00	35.75	28.50	.900	7.625	6.290	+ 1.335
10	5 X 10 Illinois	466	252	95.00	21.50	34.50	39.25	25.75	1.000	6.900	6.421	+ .479
11	5 X 10 Conn.	467	-	95.00	21.00	34.50	38.00	27.50	1.075	7.825	6.264	+ 1.561
12	5 X 15	468	249	97.50	20.75	34.00	38.50	24.75	.675	5.700	6.414	- .714
13	6 X 4	469	-	90.00	21.75	34.25	37.25	25.25	.775	7.425	6.194	+ 1.231
14	6 X 15	470	-	100.00	17.50	31.00	34.50	28.75	1.050	7.000	6.474	+ .526
15	8 X 3	471	253	75.00	24.50	36.25	40.25	36.50	1.500	6.550	6.089	+ .461
16	8 X 6 Illinois	472	250	100.00	20.25	33.50	35.25	30.25	.625	7.600	5.621	+ 1.979
17	8 X 6 Conn.	473	-	100.00	22.00	34.75	38.75	28.00	.925	6.475	6.053	+ .422
18	8 X 6 Idaho	474	-	85.00	22.75	35.00	38.25	28.50	3.475	7.475	7.802	- .327
19	8 X 15	475	254	100.00	20.25	34.50	40.50	27.25	.825	6.725	6.250	+ .475
20	9 X 1	476	255	92.50	22.00	35.00	37.75	31.00	1.400	7.250	5.863	+ 1.387
21	9 X 3	477	256	72.50	24.50	36.75	40.00	27.00	.800	7.975	5.374	+ 2.601
22	9 X 4	478	258	87.50	23.25	35.00	38.50	26.25	.700	6.475	5.789	+ .686
23	9 X 6 Illinois	479	257	100.00	20.75	34.00	36.75	30.00	.800	7.150	5.760	+ 1.390
24	9 X 6 Conn.	480	-	89.75	22.50	35.25	37.75	30.25	.850	6.925	5.415	+ 1.510
25	9 X 10 Illinois	481	259	90.00	23.00	35.50	37.50	28.50	1.250	7.825	6.286	+ 1.539

Table 7.- (Continued)

Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 26	Number of days from June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8 (E)	9 (F)	10(X)	11**	12***
A. COUNTRY GENTLEMAN HYBRID STRAINS											
Obtained from Illinois Agr. Exp. Sta. (Dr. W. A. Huelsen) Twenty-eight strains continued											
26 9X10 Conn.	482	-	85.00	22.50	35.00	38.75	28.75	.825	5.350	5.540	- .190
27 10 X 4	483	-	97.50	18.75	32.25	35.50	27.25	.825	7.600	6.350	+ 1.250
28 10 X 15	484	260	97.50	19.50	33.00	38.25	25.00	1.100	6.025	6.856	- .831
Obtained from Iowa Agr. Exp. Sta. (Dr.E. S. Huber) Fourteen strains											
1 900 X 1445	485	245	85.00	23.25	35.00	37.75	29.25	1.075	10.125	5.603	+ 4.522
2 1607 X 1445	486	-	95.00	22.75	34.25	38.50	32.00	.500	5.850	4.919	+ .931
3 1919 X 1445	487	-	47.50	27.50	38.50	42.25	25.00	.875	6.525	5.015	+ 1.510
4 (1612 x 908) X 1445	488	-	50.00	28.50	38.75	43.50	26.00	.950	5.875	4.873	+ 1.002
5 908 X 1434	489	-	35.00	29.75	39.00	41.50	29.00	.500	5.200	3.646	+ 1.554
6 1389 X 1434	490	247	67.50	25.25	37.25	40.50	30.75	.525	3.025	4.405	- 1.380
7 1610 X 1434	491	-	14.25	31.50	40.25	42.00	26.25	.850	5.075	3.830	+ 1.245
8 1620 X 1434	492	-	5.00	34.75	41.00	43.50	28.00	.650	2.450	2.918	- .468
9 1913 X 1434	493	-	55.00	27.75	36.75	37.50	33.50	.800	4.325	3.756	+ .569
10 1919 X 1434	494	-	66.00	26.75	38.25	40.25	26.50	2.175	3.775	6.287	- 2.512
11 891 X 1434	495	-	43.25	28.50	38.00	39.75	25.25	.975	4.300	4.890	- .590
12 900 X 1434	496	246	72.50	26.50	36.00	39.50	31.00	.850	5.150	4.612	+ .538
13 Roland X 1434	497	-	65.00	25.50	36.25	39.50	26.25	.575	3.950	5.070	- 1.120
14 908 X 1612	498	-	20.00	30.50	40.75	44.00	22.75	.750	4.825	4.480	+ .345
B. EVERGREEN HYBRID STRAINS											
Obtained from Conn. Agr. Exp. Sta. (Dr. W. R. Singleton) Two strains											
1 C 85 X C 77.....	499	-	100.00	18.50	32.50	35.75	33.50	1.175	9.000	5.756	+ 3.244
2 C 78 X C 77	500	-	87.50	21.75	34.00	38.00	28.50	.500	3.250	5.418	- 2.168

Table 7.- (Continued)

	Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 26	Number of days from June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest.)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
	1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
	EVERGREEN HYBRID STRAINS											
	Obtained from Illinois Agr. Exp. Sta. (Dr. W. A. Huelsen) Fourteen strains											
1	1 X 11	501	-	97.50	20.25	33.50	35.75	28.00	.775	3.725	6.049	- 2.324
2	3 X 11	502	-	95.00	21.50	34.00	37.75	31.00	.800	5.000	5.446	- .446
3	6 X 11	503	-	80.00	24.00	35.25	37.50	26.75	1.025	4.300	5.784	- 1.484
4	8 X 11	504	-	100.00	19.75	33.00	36.50	33.75	1.450	6.050	5.832	+ .218
5	9 X 11	505	-	75.00	24.50	36.25	40.25	27.25	.475	4.450	5.104	- .654
6	10 X 11	506	-	97.50	20.00	32.25	34.25	31.25	.925	5.825	5.701	+ .124
7	11 X 14	507	273	75.00	23.75	34.25	35.75	30.75	.400	4.450	4.576	- .126
8	13 X 11	508	274	97.50	20.75	34.00	38.00	34.00	1.050	3.925	5.311	- 1.386
9	13 X 14	509	275	95.00	21.25	33.00	35.00	36.00	1.275	4.700	5.106	- .406
10	14 X 6 Idaho	510	-	67.50	24.75	35.50	38.25	25.75	1.050	3.000	5.665	- 2.665
11	14 X 10 Idaho	511	-	95.00	21.00	33.00	33.75	32.75	1.525	4.825	5.841	- 1.016
12	14 X 11	512	-	82.50	24.00	34.25	36.50	30.25	.825	4.750	5.122	- .372
13	14 X 13 Idaho	513	-	75.00	25.00	36.25	38.25	26.50	.475	4.825	5.171	- .346
14	15 X 11	514	-	100.00	18.50	32.00	36.75	31.00	1.025	3.900	6.012	- 2.112
	Obtained from Iowa Agr. Exp. Sta. (Dr. E. S. Haber) Ten strains											
1	12E X 1248	515	263	85.00	23.75	35.25	38.25	28.75	.325	3.000	4.996	- 1.996
2	191 X 1248	516	-	95.00	17.50	31.50	34.00	31.25	.725	4.200	5.727	- 1.527
3	261 X 1248	517	261	80.00	24.25	37.50	40.00	25.00	1.200	3.575	6.177	- 2.602
4	377 X 1248	518	-	100.00	20.00	33.25	32.25	30.25	.925	3.700	5.899	- 2.199
5	505 X 1248	519	-	92.50	20.50	32.50	35.75	28.75	.400	3.900	5.503	- 1.603
6	777 X 1248	520	-	82.50	24.25	36.50	29.50	28.25	.325	5.650	4.980	+ .670
7	1179 X 1248	521	-	72.50	25.25	36.75	40.75	30.25	.425	4.850	4.486	+ .364
8	1363 X 1248	522	262	82.50	22.25	35.00	38.25	32.50	1.025	6.250	5.114	+ 1.136
9	1363 X 191	523	266	92.50	21.50	33.50	38.25	29.00	1.050	4.925	5.921	- .996
10	12 E X 191	524	265	92.50	21.50	32.75	34.00	31.75	1.250	4.850	5.668	- .818

Table 7.- (Continued)

Strain pedigree	Strain number 1937	Strain number 1936	Percent of plants tasseled on July 26	Number of days from June 30 to appearance on 50 percent of plants of: Tassels	Pollen	Silks	Mean height of plants on July 7 (inches)	Mean number of borers per plant (Nat. infest)	Mean number of borers per plant (Additional hand infestation): Observed	Expected	Difference
1	2	3	4(A)	5(B)	6(C)	7(D)	8(E)	9(F)	10(X)	11**	12***
EVERGREEN HYBRID STRAINS											
Obtained from Maryland Agr. Exp. Sta. (Dr. R. G. Rothgeb) Four strains											
1 Evergreen X H33-1-2-2-1	525	-	100.00	20.25	35.00	39.25	30.00	.925	4.425	5.914	- 1.489
2 Evergreen X H84-1-2-1-1	526	-	77.50	23.25	37.25	40.00	32.50	.900	3.375	4.824	- 1.449
3 Moneymaker X H84-1-2-1-1	527	-	47.50	29.25	40.00	43.50	29.75	.150	2.575	3.504	- .929
4 Hopeland (Variety)	528	272	90.00	22.00	38.75	38.25	33.00	.475	5.300	4.727	+ .573
Obtained from Ohio Agr. Exp. Sta. (Dr. J. B. Park) Three strains											
1 sN 264 X N.J.	529	-	72.50	24.00	36.00	39.75	30.00	.750	3.750	4.919	- 1.169
2 sN 238 X 22g	530	-	95.00	23.25	35.50	38.50	31.50	1.225	5.050	5.562	- .512
3 66 b X 27 c	531	-	67.50	26.25	39.00	43.00	22.25	.325	4.050	5.443	- 1.393
Average (C.Gent. and Evergreen strains)			81.79	23.06	35.23	38.42	28.52	.917	5.543	5.543	
Standard deviation (strain means) - ---			20.78#	3.29#	2.22#	2.36#	2.97#	.456#	1.637#		
Standard error (strain means)			10.02	1.46	1.07	1.72	2.29	.364	.949		
Least significant difference between strain means			27.96	4.06	2.99	4.81	6.38	1.015	2.648		

* Measurements in each replicate based on ten plants, totalling forty plants per strain in this experiment, with some exceptions.

** Calculated by the following equations based on the data in columns 4, 5, 8, 9, and 10:
Expected populations = 9.89498 + (+.01771)A + (-.09565)B + (-.15334)E + (+84827)F. The mean results for each strain, in the columns corresponding to the respective letters in the equation, are substituted for the letters in succession.

*** Error of estimate. Standard error of estimate is 1.4394.

\# Highly significant.

respectively. The observed larval populations among the strains (the dependent variable), which reflect the influence of the variable conditions represented by the data contained in columns 4 to 9, are given in column 10, and identified by the symbol X. The expected larval populations (column 11) represent the average of performance of the strains adjusted to the varying experimental conditions of the strains by multiple regression. The deviations of the observed from the expected larval populations (column 12) represent the relative performance of the strains under similar conditions of test, in so far as due account was taken of the information contained in the data of columns 4 to 9, and reflect the portion of variability among the strains not explained by the independent variables used. On this basis the deviations afford a directly comparable statistic for evaluation of the strains with respect to possible resistance. Although the data for six independent variables (A to F) are presented in each table, not all were used in each instance in the evaluation of the results. Thus, all were used in the evaluation of the results obtained in 1935 and 1936, but only a total of four was used in the treatment of the 1937 results. In that year it was found that as good results were obtained by the use of four of the independent variables as by the use of all. Owing to variable conditions of infestation and vigor of the different sorts of strains tested in 1937, it was found essential to treat them in separate groups. The independent variates used in the case of each group varied in accordance with the best estimate obtained by trial determinations. The multiple regression equation by which the expected larval populations were estimated is given as a footnote in the respective tables and in each instance was found to be highly significant. The standard deviations, standard errors, and least significant mean differences among the strains were calculated for the various data in the respective tables and are shown under the respective columns of data to which they apply.

Experimental results in 1935. The strain results obtained in 1935 are given in table 2. The strains are arranged under two main headings, inbred lines and hybrid crosses, according to sort. The source of each strain is shown in parentheses following its pedigree. The results of the strains with test numbers from 1 to 32 were based on four replicated tests, and those of higher numbers on three replicated tests. The expected larval populations were based on consideration of variables A to F (columns 4 to 9). The following eleven strains were selected as of promise with regard to possible resistance to the borer on the basis of showing a negative deviation from expected performance of at least 1.781, the standard error of estimate: Bantam inbred lines Purdue P39 (1), Michigan 331098 (40), and Connecticut C-6 (82); Country Gentleman inbred lines Iowa 900 (9), Iowa 1445 (23), and Illinois R8 (24); Evergreen inbred lines Iowa 377 (13), and Michigan 331220 (83); and Country Gentleman hybrid crosses Illinois 9 X 1 (36), Illinois 8 X 15 (85), and Illinois 10 X 15 (87). None of the Bantam nor Evergreen hybrid crosses was found below average in performance.

Experimental results in 1936. The strain results for 1936 are given in table 3. The strains are arranged under two main headings, inbred lines and hybrid crosses, and are grouped by sort and source. The results are based on four replicated tests. The expected larval populations were based on consideration of variables A to F (columns 4 - 9). The following twenty strains were selected as of promise with regard to possible resistance to the borer on the basis of showing a negative deviation from expected performance of at least 1.752, the standard error of estimate (the source and pedigree follow in succession with the strain test number enclosed in parentheses): Bantam inbred lines Iowa 45 (101), Purdue 9 (104), Michigan 351828 (119), Minnesota 13-34 (125), Minnesota 26-34 (128), Connecticut C-7 (135), Ohio sG206-2-1-5 (138), and Ohio sG200-1-1-5 (139); Country Gentleman inbred lines Iowa 1434 (150), and Iowa 1445 (151); Evergreen inbred lines Purdue 1009-2 (185), Michigan 351809 (206), Iowa 1071 (216),and Iowa 191 (217); Bantam hybrid crosses Iowa 51 X 30 (226), Iowa Golden Sunshine X 45 (227), Michigan 351525 X 351085 (228), Michigan 351807 X 351085 (232), and Minnesota 38-28 X Golden Bantam (243); and Evergreen hybrid cross Maryland Evergreen X H146-1-1-1 (270). None of the Country Gentleman hybrids was found below average in performance.

Experimental results in 1937. Owing to hand-infestation of the Bantam strains on one date and the Country Gentleman and Evergreen strains on another date, it was essential to treat the two groups of strains separately. A further division was made in each group with respect to inbred lines and hybrid crosses, since these were widely divergent in seasonal growth and vigor and a sufficient number of each sort was available for a reliable analysis. The Country Gentleman and Evergreen strains were treated together owing to their similar habits of seasonal growth and vigor. Thus the strains tested in 1937 were treated in four independent groups as follows: (1) Bantam inbred lines, (2) Bantam hybrid crosses, (3) Country Gentleman and Evergreen inbred lines, and (4) Country Gentleman and Evergreen hybrid crosses. The results obtained for each group are discussed separately, and are presented in tables 4 to 7.

The Bantam inbred group comprised 29 strains. Their results are given in table 4. The data in columns 4, 7, 8, and 9 were the basis for the determination of the expected larval populations. The following four strains were selected as of promise in regard to possible resistance to the borer on the basis of showing a negative deviation from expected performance of at least 1.7298, the standard error of estimate (the source and pedigree follow in succession with the strain test number enclosed in parentheses): Iowa 13 (280), Michigan 351828 (283), Minnesota 13-34 (298), and Minnesota 26-34 (301).

The Bantam hybrid group comprised 42 strains. Their results are given in table 5. The data of columns 4, 5, 8, and 9 were the basis for the determination of the expected larval populations. The following three strains were selected as of promise with regard to possible resistance to the borer on the basis of showing a negative deviation from expected performance of at least 0.8704, the standard error of estimate (the source and pedigree follow in succession with the strain test number enclosed in parentheses): Michigan 1828 X 1819 (423), Michigan 1828 X 1820 (424), and Michigan 1828 X 1822 (425).

The Country Gentleman and Evergreen inbred group comprised 71 and 30 strains, respectively. Their results are given in table 6. The data in columns 4, 6, 8, and 9 were the basis for the determination of the expected larval populations. The following nineteen strains were selected as of promise in regard to possible resistance to the borer on the basis of showing a negative deviation from expected performance of at least 1.4060, the standard error of estimate (the source and pedigree follow in succession with the strain test number inclosed in parentheses): Country Gentleman inbred lines Illinois R1 (308), Illinois R15 (316), Purdue FR17 (5)1 (326), Purdue FR22(4)1 (327), Purdue W7(4)1 (338), Purdue 348(2)2 (344), Purdue 7620 (8)1 (356), Purdue 8035 (6)1 (361), and Purdue 8483(4)1 (378); and Evergreen inbred lines Connecticut C-78 (380), Iowa 191 (386), Iowa 377 (388), Maryland H84-1-2-1-1-4 (394), Maryland H33-1-2-2-1-4 (395), Ohio sN264-1-1-1 (402), Purdue 4-6-1 (403), Purdue V4 (6)1 (404), Purdue 1014 (2)1 (408), and Purdue 119-2-4 (411).

The Country Gentleman and Evergreen hybrid group comprised 42 and 33 strains, respectively. Their results are shown in table 7. The data in columns 4, 5, 8, and 9 were the basis for the determination of the expected larval populations. The following thirteen strains were selected as of promise in regard to possible resistance to the borer on the basis of showing a negative deviation from expected performance of at least 1.4394, the standard error of estimate (the source and pedigree follow in succession with the strain test number in parentheses): Country Gentleman hybrid cross Iowa 1919 X 1434 (494); and Evergreen hybrid crosses Connecticut C-78 X C-77 (500), Illinois 1 X 11 (501), Illinois 6 X 11 (508), Illinois 14 X 6 Idaho grown (510), Illinois 15 X 11 (514), Iowa 12E X 1248 (515), Iowa 191 X 1248 (516), Iowa 261 X 1248 (517), Iowa 377 X 1248 (518), Iowa 505 X 1248 (519), Maryland Evergreen X H33-1-2-2-1 (525), and Maryland Evergreen X H 84-1-2-1-1 (526).

Discussion and Conclusions

Although a large number of hybrid strains were included in the tests in each year, the principal objective of the investigations to date centered on the determination of resistance in the inbred lines, since the inbred lines are of basic utility in the essential breeding activities associated with the intensification and transfer of the trait to agronomically desirable strains adapted to specific localities. The information obtained on the hybrid progenies of the inbred lines mainly served as a basis of preliminary evaluation of the performance of the inbred lines in hybrid combination.

The inbred lines selected as of possible resistance to the borer during the three years of test have been assembled in table 8, showing their performance in the years tested. The years in which the strains showed a negative deviation from average performance at least equal to the standard error of estimate in the respective year are indicated by asterisk. The pedigree and source of each strain are given in column 1; the test number of the strain, the observed larval population, the expected larval population, and the deviation of the observed from the expected larval population follow in succession for each year.

Among the Bantam inbred strains presented in table 8, two were found to be of outstanding promise in regard to resistance to the borer in each year of their occurrence in the tests, namely, Michigan 351828 (number 6), and Minnesota 26-34 (number 8). In a series of five hybrid progenies containing the former, all were found to harbor lower larval populations than expected when tested in 1937 (table 5, 422 to 426); a single hybrid progeny containing 26-34 was available for the test in 1936 and again in 1937, and in each year was found to harbor lower larval populations than expected (table 2, 239 and table 5, 448). The inbred strains and their hybrid progenies were of early seasonal maturity. Detailed investigation of both inbred strains will follow to determine the cause of their apparent relative resistance to larval establishment and development, and their possibilities with regard to intensification and transfer of the trait. Several other of the inbred lines shown in table 8 appear of favorable promise, notably Iowa 9 (number 5) and Minnesota 13-34 (number 7). Their ultimate value will be determined by further tests. No strains of outstanding performance appear among the Country Gentleman and Evergreen inbred lines presented in table 8. However, several appear favorable in the production of consistently lower larval populations than expected in the various years tested. Further tests are necessary to determine their value.

An initial step has been undertaken to transfer resistance from field corn inbred strains to sweet corn. A field corn inbred strain, Illinois R4, was determined to possess definite resistance to the borer[1]. In 1937 this strain was crossed with several sweet corn inbred strains. The sweet corn segregates from these crosses will be tested when available to determine their possible resistance. Similar work has been done with Maize Amargo, a South American flint corn, which appeared to be resistant to the corn borer[2]. A number of the sweet corn segregate inbred lines were received for test in the different years. In general, inadequate stands of plants of these were available for conclusive evidence of their performance. Adequate information, however, was available on a number of their hybrid progenies, which showed lower larval populations than were to be expected when tested in 1936 (table 3, 228 to 233). When retested in 1937 (table 5,428 to 432), one harbored a lower population than expected, another showed average performance, and the remaining three failed to produce stands of plants. Failure to secure adequate stands of plants of the inbred lines was attributed to the poor quality of the seed owing to the unusual unseasonal conditions prevailing when the seed was produced. Further tests are planned with seed produced during 1937.

---

1 Patch, L. H. 1937. Resistance of a single-cross hybrid strain of field corn to the European corn borer. Jour. Econ. Ent. 30 (4): 271-78 April.

2 Marston, A. R. and Mahoney, C. H. 1932. Progress report on breeding of sweet corn for corn borer resistance. Proceedings of the American Society for Horticultural Science. Vol. 29.

Table 8.-Comparison of the relative performance of inbred sweet corn strains selected for possible resistance to the European corn borer in tests conducted near Toledo, Ohio, in 1935, 1936, and 1937. An asterisk indicates the selection of the strain in a specific year on the basis of showing a negative deviation from expected performance of at least once the standard error of estimate in that year.#

Strain pedigree (source shown in parentheses)	Mean number of larvae per plant											
	Data in 1935				Data in 1936				Data in 1937			
	Test No.	Observed	Expected	Deviation	Test No.	Observed	Expected	Deviation	Test No.	Observed	Expected	Deviation
1	2	3	4	5	6	7	8	9	10	11	12	13
A. INBRED STRAINS												
Group 1. Bantam Inbred Lines												
1 P39 (Purdue).....	1	7.0	9.2	- 2.2*	145	7.2	7.3	- .1	307	4.975	4.574	+ .401
2 331098 (Mich.).....	40	7.2	9.7	- 2.5*	-	-	-	-	-	-	-	-
3 C6 (Conn.).....	82	9.5	12.5	- 3.0*	134	10.8	9.6	+ 1.2	277	9.250	7.957	+ 1.293
4 45 (Iowa)	15	6.0	7.5	- 1.5	101	5.8	8.6	- 2.8*	284	1.750	2.458	- .708
5 9 (Iowa)	-	-	-	-	104	2.9	6.4	- 3.5*	279	1.750	3.214	- 1.464
6 351828 (Mich.)	-	-	-	-	119	5.0	8.0	- 3.0*	288	.950	4.669	- 3.719*
7 13-34 (Minn.)	-	-	-	-	125	8.2	10.2	- 2.0*	298	2.425	4.538	- 2.113*
8 26-34 (Minn.)	-	-	-	-	128	6.3	10.9	- 4.6*	301	2.175	5.993	- 3.818*
9 C7 (Conn.)	38	10.5	11.3	- .8	135	6.4	8.7	- 2.3*	278	Insufficient stand.		
10 sG206-2-1-5 (Ohio)..	-	-	-	-	138	4.9	7.6	- 2.7*	-	-	-	-
11 sG200-1-1-5 (Ohio)..	-	-	-	-	139	5.3	7.6	- 2.3*	-	-	-	-
12 13 (Iowa)	25	8.0	7.9	+ .1	102	5.8	5.9	- .1	280	2.150	3.964	- 1.814*
Group 2. Country Gentleman Inbred Lines												
13 900 (Iowa)	9	6.6	8.4	- 1.8*	149	8.7	6.5	+ 2.2	319	8.200	6.953	+ 1.247
14 1445 (Iowa).....	23	4.4	6.8	- 2.4*	151	2.2	4.0	- 1.8*	321	5.625	5.784	- .159
15 R8 (Ill.).....	24	4.4	6.9	- 2.5*	162	3.7	4.1	- .4	313	5.625	6.881	- 1.256
16 1434 (Iowa).....	-	-	-	-	150	1.6	4.2	- 2.6*	320	4.250	4.609	- .359
17 R1 (Ill.).....	16	6.0	7.6	- 1.6	157	6.3	5.0	+ 1.3	308	4.825	6.756	- 1.931*
18 R15 (Ill.).....	11	8.0	7.6	+ .4	165	6.3	6.0	+ .3	316	5.650	7.997	- 2.347*
19 FR17(5)1 (Purdue)...	-	-	-	-	-	-	-	-	326	4.100	6.774	- 2.674*
20 FR22(4)1 (Purdue)...	-	-	-	-	-	-	-	-	327	5.200	7.327	- 2.127*

Table 8.- (Continued)

Strain pedigree (Source shown in parentheses)	Mean number of larvae per plant											
	Data in 1935				Data in 1936				Data in 1937			
	Test No.	Observed	Expected	Deviation	Test No.	Observed	Expected	Deviation	Test No.	Observed	Expected	Deviation
1	2	3	4	5	6	7	8	9	10	11	12	13
Group 2. Country Gentleman Inbred Lines (Continued)												
21 W7(4)1 (Purdue).....	-	-	-	-	-	-	-	-	338	4.425	6.094	- 1.669*
22 348(2)2 (Purdue).....	-	-	-	-	-	-	-	-	344	4.250	6.709	- 2.459*
23 7620(8)1 (Purdue).....	-	-	-	-	-	-	-	-	356	6.150	7.742	- 1.592*
24 8035(6)1 (Purdue).....	-	-	-	-	-	-	-	-	361	4.500	6.004	- 1.504*
25 8488(4)1 (Purdue).....	-	-	-	-	-	-	-	-	378	5.750	7.437	- 1.687*
Group 3. Evergreen Inbred Lines												
26 377 (Iowa).....	13	5.6	7.7	- 2.1*	-	-	-	-	388	6.425	9.068	- 2.643*
27 331220 (Mich.).....	83	7.5	9.7	- 2.2*	-	-	-	-	-	-	-	-
28 1009-2 (Purdue).....	4	7.0	7.5	- .5	185	1.6	3.7	- 2.1*	407	6.225	5.666	+ .559
29 351809 (Mich.).....	-	-	-	-	206	5.1	7.2	- 2.1*	-	-	-	-
30 1071 (Iowa).....	2	5.9	6.5	- .6	216	1.6	3.6	- 2.0*	390	3.875	3.694	+ .181
31 191 (Iowa).....	32	6.5	7.3	- .8	217	4.6	6.4	- 1.8*	386	6.325	8.299	- 1.974*
32 C-78 (Conn.).....	88	11.7	9.6	+ 2.1	220	11.0	6.9	+ 4.1	380	6.800	8.197	- 1.397*
33 H84-1-2-1-1-4 (Md.)....	-	-	-	-	-	-	-	-	394	3.025	4.571	- 1.546*
34 H33-1-2-2-1-4 (Md.)....	-	-	-	-	-	-	-	-	395	4.600	6.306	- 1.706*
35 sN264-1-1-1 (Ohio).....	-	-	-	-	-	-	-	-	402	5.225	6.671	- 1.446*
36 4-6-1 (Purdue).....	-	-	-	-	177	8.8	6.3	+ 2.5	403	5.875	7.738	- 1.863*
37 V4(6)-1 (Purdue).....	-	-	-	-	180	3.4	4.6	- 1.2	404	4.475	6.052	- 1.577*
38 1014(2)1 (Purdue).....	-	-	-	-	183	4.9	5.8	- .9	408	6.275	7.695	- 1.420*
39 119-2-4 (Purdue).....	-	-	-	-	176	4.8	5.1	- .3	411	6.200	7.647	- 1.447*

#Expected performance of strains based on the multiple regression of larval population on a number of independent variables as shown in the general tables.